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# Motivating change: An Interactive journey in sustainability in environmental concerns

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## Thesis Documentation for the Master of Fine Arts Degree

Motivating Change: An Interactive Journey in Sustainability in Environmental Concerns
by Brittany Lamb

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A Thesis submitted to the Faculty of the
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in candidacy for the degree of
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Computer Graphics Design

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**Dedication**

To the CGD Class of 2008
for their constant support,
motivation and inspiration.

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technical expertise.

**Abstract**

Despite the grave environmental issues facing the world, little is being done to educate our future generation of "consumers" on resource consumption and waste generation. There is a need for major change in the approach to education about sustainability. In the classroom, environmental education has been presented statically through traditional teaching methods.

Environmental education is evolving to include information on how a person's efforts and behavior can affect global change. However, changes in education are not happening as rapidly as the deterioration of the environment. The sustainability of the environment requires action and reaction, therefore it requires a more interactive approach to education. Can education through interactivity result in major changes? Can the inclusion of computer graphics as an alternative approach to education promote and motivate change in a person's behavior in relation to the environment?

This thesis is an exploration of the role Computer Graphics can play in environmental education. It is divided into two main components, Design Center and Action Toolkit. Through interactive engagement of the user this thesis offers experiential learning that successfully communicates the issue of sustainability of the environment, creating the opportunity to develop a lasting change in their daily behavior.

**Project Website:**
http://www.sustainabilitee.info

**Key Words**

Environmental Education

Green Design

Interactive Design

Information Design

Sustainability

User Experience

**Table of Contents**

## Introduction

The absence of computer graphics in environmental education is a severe handicap to the knowledge of sustainability and other environmental concerns facing this world. This thesis is addressing the role of computer graphics in promoting and motivating change in people's behaviors related to the environment. The premise is to develop an interest in product assessment, consumption, and a general awareness of sustainability. To develop this awareness, the thesis will challenge a user to evaluate a product for energy efficiency, durability, end-of-life, packaging, and use of innovative materials.

The purpose and focus is education through interactivity, to create an experience that sparks reaction. It is an application that provides background information, product design, and valuable resources that directly communicates and implements sustainability to develop a lasting change in people's daily behaviors. The project contains elements of a grassroots campaign and social advertising efforts designed to grow and be passed on.

Many people are unaware of the environmental crisis going on around them. Without education on these issues, there is little chance the uninformed population will take interest or action in current eco-friendly campaigns and learn new behaviors needed to protect the world. Drastic changes need to be made in people's actions and behaviors to sustain our way of life for future generations. An alternative approach in educating people on sustainable use of our resources through sustainable design practices in a virtual environment is one solution. This alternative approach challenges the standard approach of presenting information in print, or on a website.

### Main Project Objectives:

- Using computer graphics to promote and motivate change in people's behaviors in relation to the environment.
- Create an alternative approach and method to education on the topic of sustainability.
- Identify the relationship between sustainability and design.
- Successfully communicate the need for major change in resource consumption and waste generation.
- Commit to sustainable practices in the production of the project.

**Review of Literature**

A wide range of books, online articles, videos, games, and other media was used for research analysis, ideation, initial concepts, design references and technology resources. The final amalgamation of research is organized by significant visual elements in the project or by stages and components in the t-shirt making process or product lifecycle.

## PRODUCT LIFECYCLE FROM EXTRACTION TO DISPOSAL

*Story of Stuff*
Annie Leonard, 4 December 2007

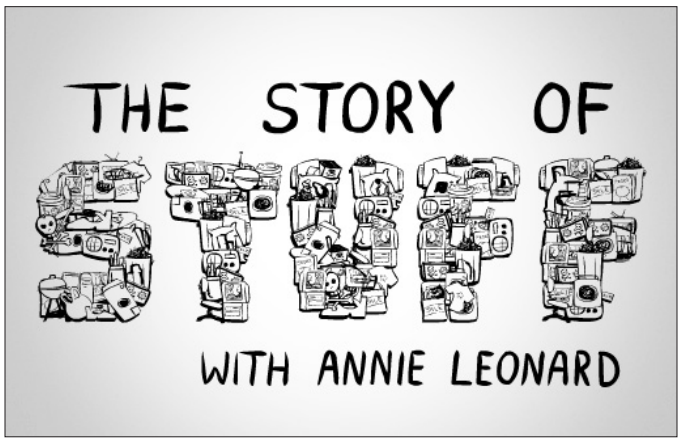



**Image A.1**
*Story of Stuff*
*Intro Credit*

The Story of Stuff is a 20-minute short animation of the journey our "stuff" takes from its extraction to production, sale, use, and disposal. The major influences of *The Story of Stuff* by Annie Leonard revolve around her methods of using new media to implement change in the world, delivering important messages to the masses. I am exploring non-conventional ideas of how to teach and educate people on major environmental concerns and motivate action. Annie does exactly this by creating an entertaining and animation that engages the viewer while still communicating complex messages and ideas. Her message has taken the form of viral activism from being made available online to view and download. Annie's "story" gets passed on showing up on feeds, blogs, and other websites with a trail of people's comments. Annie breaks down her story into the different elements of a product's life cycle. I am choosing to incorporate the same sort of organization to my project, breaking it down to the bare essentials of extraction, production, distribution, and disposal.

*http://organicclothing.blogs.com*
Shellie and Michael Lackman, 2005

The Organic Clothing Blog is a resource for organic, natural, and sustainable clothing. The site contains a Clothing, Fashion, and Fiber Glossary and various articles grouped into the categories of Eco-Issues, Fashion, Fiber and Fabrics, General Interest, and Health and Wholeness. The organic clothing blog links to various "green" resources that include other green living blogs, sustainable designer websites, blog directories, and governmental agencies. In the early stages of my research the organic clothing blog provided a wealth of background information that helped me to understand the importance of growth, extraction, and processing methods involved with different types of fibers.

*http://inhabitat.com, T.S.Designs Eco-Friendly T-Shirt Printing*
Jill Fehrenbacher 3, April 2007


**Image A.2**
*T.S. Designs T-shirt Label*

Inhabitat.com is a weblog started by NYC designer Jill Fehrenbacher as a way to call attention to discussions around the future of product, interior and architectural design. Her article on t-shirt company T.S. Designs highlights innovation in garment printing technology. The article is an overview of their new water-based process of printing called Rehance that has no PVC, phlatlates, or hazardous residues. Shirts are printed in their natural state and then garment dyed using a low-impact bi-functional reactive dye so the print is in the fabric. This water-based printing process is an alternative process and viable solution to the environmental and human health concerns caused by plastisol inks.

*"Green Printing" Uses Sustainable Methods and Materials*
Michael Beckman, 2007

The use of some solvents, cleaners, inks and other chemicals in the screen printing process are toxic and hazardous to the environment as well as your health. Michael Beckman, an authority on screenprinting, covers specific steps that can be taken to reduce the overall environmental impact of screen printing. Beckman discusses the options available in the production process and calls attention to changes that can be made to make each step of the process more sustainable. Michael Beckman's statement, "T-shirts have doubled as billboards for pro-environmental sentiments as far back as the first Earth Day in 1970" supports my concept of using t-shirts as my soapbox for messages on sustainability.

*http://www.greenyour.com/body/clothing/t-shirt*

GreenYour is a comprehensive guide and online resource for greening all aspects of your life including: your home, office, body, lifestyle, and transportation. The site was started by a group of environmental experts, writers, and researchers to make facts, tips, and answers more accessible for everyone. The clothing section covers two of the biggest issues with t-shirts: production/processing and the dyeing of fabrics. Multiple eco-friendly dyeing methods are discussed in the tip "Choose T-shirts colored with eco-friendly dyes". Selecting low-impact, fiber-reactive dyes, or natural, plant-based dyes requires less water and less energy and poses fewer health and environmental concerns compared to conventional dyes.

*http://www.sustainablepackaging.org/*
*2004*


**Image A.3**
*SPC Design Library*

The Sustainable Packaging Coalition is a project founded in 2004 by GreenBlue, a nonprofit institute that seeks opportunities to redesign existing industrial systems to achieve economic, social and environmental gains. The coalition advocates best practices and design guidelines of the industry. Sustainable Packaging Coalition supports innovative packaging materials and systems that reflect and support the definition of sustainable packaging. Downloadable resources, packaging projects, design gallery, metrics software, and industry news helps members and nonmembers learn and practice sustainable packaging design.

*Sustainable Fashion and Textiles: Design Journeys*
Kate Fletcher, 2008

Designer Kate Fletcher gives a unique perspective on the progress of the fashion and textile world by providing concrete solutions and goal setting for making changes to the industry based on sustainability and social responsibility. Her book supports the idea of using design as the leading change catalyst rather than patching a problematic system. The book is organized into two halves, the first four chapters focusing on the lifecycle of a garment including the stages of extraction, production, consumer use, and disposal. The rest of the book focuses more on Fletcher's ideas for designing for the "life" of the garment and her belief in non-large-scale production and distribution, making local connections between designers, manufacturers, and consumers.

*Well dressed? The present and future sustainability of clothing and textiles in the United Kingdom*
University of Cambridge Institute for Manufacturing, 2006

This report details a comprehensive study conducted by five people over the period of one year at the Institute for Manufacturing on the future supply of clothing and textiles to the UK. It is a more wholistic presentation of the possible routes to more sustainable global industrial systems, including the thoughts and contributions of leaders in the industries of design, production, and operations. The report offers the opportunity for academia to take part in the movement for sustainable practices, an angle I strongly support in my project.

*http://planetgreen.discovery.com/go-green/green-laundry, How to Go Green: Laundry*
Collin Dunn, 8 July, 2008

This article brings front and center the idea of small actions and choices making big impact. The simple act of revising your laundry habits can greatly effect your environmental footprint. The majority of a clothing item's footprint comes from its time spent in the wash and dry cycle. Limiting consumption habits and switching to Energy Star certified products in your laundry regimen is in the long run both economically and environmentally friendly.

*Waste Couture: Environmental Impact of the Clothing Industry*
Luz Claudio, 2007

Luz Claudio defines American consumption as "waste couture," a type of fast fashion sold at "prices that make the purchase tempting and the disposal painless." This process that culminates in convenient and disposable fashion is one that also produces high amounts of hazardous waste and unregulated amounts of pollution into the air, ground, and water supply. While Claudio discusses the negative impacts of the industry he also offers insight into steps taken by the industry to support sustainably grown cotton, hemp, bamboo, other eco-fibers as well as biodegradable materials.

## DESIGN INSPIRATION & FEATURES

*www.Spreadshirt.com*
*2001*

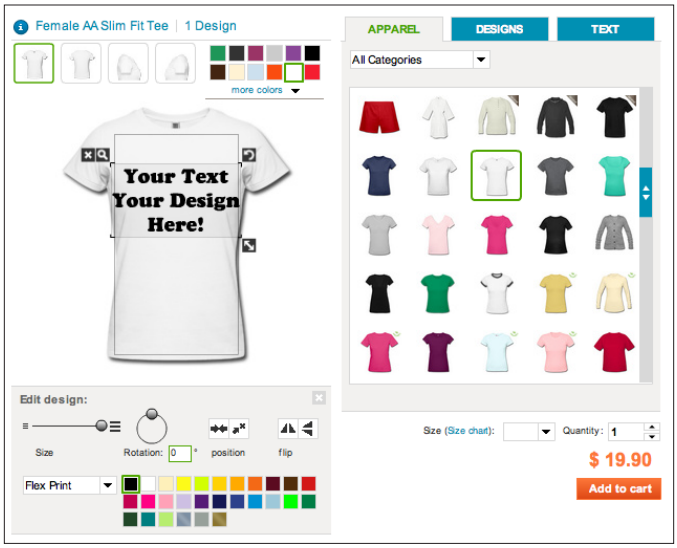



**Image B.1**
*Spreadshirt*
*T-Shirt Designer*

Founded in 2001, Spreadshirt is a company that allows their customers to create t-shirts and other apparel in one of the first ever online T-Shirt Designers. The user chooses a product and adds a design or text. There is a library for the user to look through for designs or they can upload their own image. The company offers five different sustainable shirt styles from Continental Clothing and American Apparel, all made from certified organic cotton. The T-Shirt Designer is an excellent example of a feature I want to include in my project. Repurposing their design model to include sustainable living tips and information on each stage of the lifecycle is the solution to interactive education component of my project.

*Re-Shirt: A New Backstory for the T-shirt*
Sanjay Khanna, 2008

Re-Shirt is a business concept from Shapeshifters, a global internet-based platform for cultural creatives headquartered in Vienna, Austria. Re-Shirt presents the idea that objects like t-shirts have narratives and a history. The company silk screens codes onto donated

t-shirts. Each code can be entered into Re-Shirt's website by their customers to retrieve a backstory associated with their "new" shirt from the former owner. These backstories add value by creating a more personal consumer experience and promoting the continual circulation of valuable cotton resources. Re-Shirt creates a new way of thinking about clothing which parallels the critical consumer thinking my thesis project aims to develop.

*www.Carbonica.org*
2008


**Image B.2**
*Carbonica.org*
*Page Header*

Carbonica has a refreshing and clean but tactile feel to their website. It takes a step back from the web 2.0 glossiness and focuses on a more scrapbook look and feel. The site uses handcrafted lettering and textures that communicate "lets save the earth" with a layout and graphics that piece together earthy colors with the textures of recycled materials. A faux 3D style of illustration and animation for their main header carries throughout the site. Drop shadow add realistic depth contributing to the 3D appearance. The animated flash banner on top of the pages was a major influence in my thesis. To create a simimilar visual impact on my site I decided to create a brief introduction animation for the home page of my thesis project.

## SUSTAINABILITY STANDARDS & BEST PRACTICES

*http://www.re-nourish.com*
*2006*

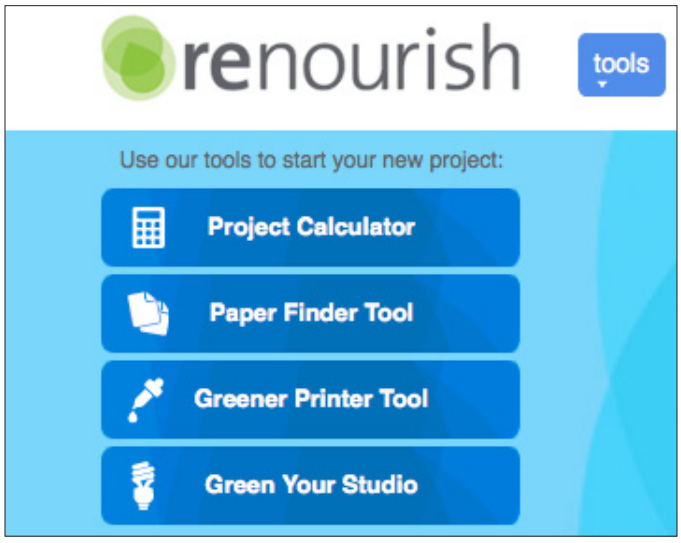



**Image C.1**
*Re-Nourish*
*Project Tools*

Re-nourish is an online toolkit and collection of resources and case-studies related to sustainable graphic design. Their aim is to change the design industry by making design sustainable by definition. They introduce a set of standards and recommendations for design projects and studios by type: print, packaging, and digital design. Standards revolve around specific criteria in areas of purpose, life cycle impact, physical format, materials, manufacturing, finishing, distribution, and disposal. I used the "greener digital design project standards" as a benchmark.

*http://www.betterthinking.co.uk/*

Better Thinking is a UK-based ethical branding consultancy that helps brands create strategies for sustainability. They started the project "Luxury Redefined" to challenge industry standards and practices in the t-shirt industry. They chose a t-shirt as their vehicle because it "means something to everyone". This project reinforced my own ideas of selecting the t-shirt as the vehicle for my messages about sustainability and education. Their project aims to actually produce the most sustainable t-shirt ever made; create a product that will highlight the many processes in the lifecycle that contribute to its environmental impact. The project is collaborative and greatly relies on the input of the public for solutions. On their site they discuss all the opportunities to improve the carbon footprint throughout the lifecycle of the t-shirt. They use an animated sequence to further support their ideas of the perfect t-shirt. Better Thinking's ideas and research will greatly aid in defining the complicated stages in the product lifecycle.

*www.hostsearch.com, Choosing a Green Web Host*
Cameron Chapman, 25 October, 2009

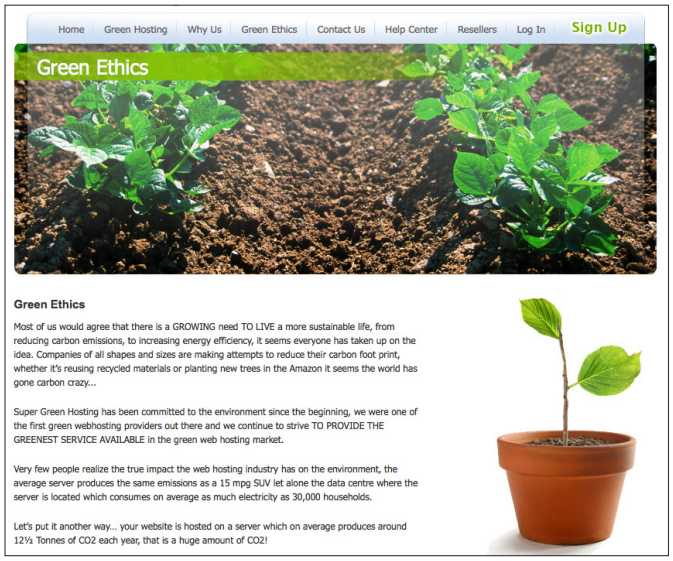



***Image C.2***
*SuperGreen Hosting Website*

This article outlines what it means to be a "green" web host. There are specific questions to ask when looking for an environmentally friendly host for your website. The article offers sample questions that include if they use renewable energy sources, if they offer carbon offset credits, do they have a relationship with any charities, and do they offer recycling programs. The article also offers measurable business reasons for investing in a sustainable web host. It is easy to believe labels like "green" and "sustainable" but they can be deceiving: be skeptical of unsubstantiated "green" labels and beware of brands that fail to address sustainability in a transparent manner. For example, Super Green Hosting is a proclaimed green web host. They claim to be "100% Carbon Neutral Friendly" and to be one of the first green web hosts and strive to provide "the greenest hosting available". The company is definitely making strides towards making web hosting more environmentally friendly but there is no proof of carbon neutrality such as a certificate and beyond efficient servers and a tree planting program, the rest are simply claims.

**Process**

I wanted to bring education, commitment to design and the arts, and my passion for a sustainable world together in the desire to make change possible. My first introduction to sustainable design and thinking came in my first year of graduate school in the form of Alex Bitterman's second year course, Design Issues Seminar. We had many in depth and enlightening conversations about designing for the future. As a designer you have the responsibility to direct the industry you are working in towards making informed decisions while creating work that is both meaningful and good for society, now and in the future.

I was introduced to eye-opening ideas such as designing for the other ninety percent of society. Out of the billions of people in the world about ninety percent have minimal or no access to things I take for granted like clean water, food, healthcare, education, or shelter. Designers are finding ways to address these basic challenges of living through the use of new materials, unique processes and systems, and innovative technologies. Understanding the available resources and tools in union with the daily needs of potential users is helping to transform lives and communities. It is clear that design is an integral part of future development and progressive change in the world.

## CONCEPT OF MOTIVATING CHANGE

I realized that bold statements like "taking action" or "making change" didn't have to sound daunting and impossible. After reading *The Tipping Point* by Malcolm Gladwell, I was armed with the theory that it is possible for an idea or behavior to tip in a way that makes it quickly and widely adopted. After explaining the spread of diseases, he draws parallels to how "It takes only the smallest of changes to shatter an epidemic's equilibrium." The epidemic example is relevant for other types of change. If ideas, products, messages and behaviors spread just like viruses do, I concluded this theory to be essential in my approach to "spreading" my own message on sustainability.

A small but targeted campaign could push the popularity of a behavior or way of thinking like making smart choices to protect the sustainability of our future. Gladwell divides the vessels for spreading "viruses" into three categories of people called Connectors, socialites who bring people together; Mavens, who like to spread the knowledge; and Salesmen, talented at convincing the uninformed. This explanation for triggering an idea and behavior enforced my original thoughts of putting my thesis project in the environment of the classroom. My thesis will take form of a project to be explored by students and directed by a teacher, by definition a hybrid of Connector, Maven, and Salesmen. In his design manifesto Allan Chochinov says, "Teach sustainability early." He suggests that schools with interest in sustainability and social responsibility will be leading the way in academia.

My first step in beginning my research was collecting general sustainability and "green" information and materials from websites, blogs, books, brochures, articles, online publications, and multimedia. I continued to experiment with a few ideas revolving around areas of environmental study in energy conservation, renewable resources, and climate change. One of my first challenges was figuring out how I could communicate such a broad concept of sustainability to the user in a topic specific manner. Sustainability is a colossal topic, and designers in all fields have such an impact in creating sustainable trends. I decided to strategically focus on several key areas of design.

## ASSOCIATED AREAS OF STUDY

I continued my research to include resources and content in several fields of design because the definition of sustainability evolves and adapts in reference to specific industries. Like a t-shirt, there is no one-size fits all sustainability solution but multiple design opportunities working at different scales, levels and timeframes, and with many different people (37, Fletcher). Areas of design are inter-related and discussions and collaboration among disciplines create a perfect environment for building upon other's ideas and paving the way for massive change. Designers of all disciplines are working to translate the bigger picture revolving around ethics and consumption behaviors as well as the smaller picture of deciding between materials that affect overall aesthetics and practical use. Fundamental design skills in combination with skills learned from related fields are needed to make insightful decisions about reducing the environmental impact of a product's lifecycle. The opportunity to build off sustainable ideas present in other fields of design propelled my submersion first into the world of industrial design, architecture design, graphic design, and finally computer graphics design.

Industrial design often equates to mass production. The decisions these designers make have the potential to affect millions of people. Products that are meant to improve the lives of people (often products of convenience) may end up poisoning the land, water, food, and consequently all of us. People of the United States are embracing the disposable lifestyle with products that are designed to be thrown out after one use or maybe a few washes. Millions of products like coffee cups, stir sticks, plastic ware, and plastic bags are designed, produced, packaged, and distributed to be sold, used, then discarded. A major offender in addition to a product is the packaging it comes in. Have you ever gotten take-out from a restaurant and find that your food was put in a plastic container or two in a plastic bag with another plastic bag of single-use condiments, napkins, and plasticware wrapped in more plastic? I have, more times than I can count.

The harmful effects of these "landfill items" on the environment is being combated with sustainable design methods. New products are being designed to decompose after use, in the presence of air, water and elements in the soil. The obvious solution is designing products than can be used and reused again or recycled then used again in a cradle to cradle cycle. Industrial designers have the choice to encourage more consumption or revolutionize the market and repair the environment. Through applying the "cradle to cradle design paradigm" from *Cradle to Cradle, Remaking the Way We Make Things* by William McDonough and Michael Braungart, designers can be impactful from conception, as well as go full circle with their products with predetermined options for uses at the end of their product lives.

Sustainable building shares all the same principles of efficient energy, water, and material use, waste and pollution reduction, resulting in the protection of human health. My interests steered towards how important the selection of materials is to any project. Choosing sustainable materials is the fundamental eco-principle in developing healthy and livable communities, in addition to saving you lots of money. Every decision in materials must be carefully considered down to the nails and glue that hold everything together. Poor choices in insulation equal to expensive energy bills. Poor design and selection of materials related to ventilation can cause extra moisture leading to mold buildup, dust, and more allergy irritants resulting in poor health for owners. Chemically

laden materials like paint containing high levels of VOCs can cause strong odors and release toxins, polluting the air you breathe. Greener materials may cost a premium up front but end up saving money in the lifetime of the building. The major takeaways from this field was the knowledge behind material choices and the relation between up front cost and lifecycle cost.

Many of the same tools, resources, and materials are shared by both graphic designers and computer graphics designers. A main differentiating factor of sustainable graphic design relates to choices in paper, printing processes, inks, and the vendors that supply them. Graphic designers need to consider the entire production process, from paper choices to printing process to distribution, use, reuse, and disposal. For printed materials it is better to take the quality over quantity approach for communication. Mindlessly sending out company mailers about events could be replaced by sending one calendar announcing all the events for the year or a monthly publication my be reduced to a more content rich quarterly publication. Consequently, using computer graphics to create a digital environment to facilitate and encourage sustainable human activity is a more sustainable choice for my thesis than a glossy 500 page printed report.

Computer graphics efficiently meets the need for data to be visualized through 2D images and illustrations, 3D modeling, and computer animation. Innovations in new computer graphics based technology has grown the use of media such as digital effects, animated films and video games in both entertainment and the sciences. User interaction with media contributes to better understanding of complex information. The combination of web design and great user experience has moved entire systems such as billing and banking online, getting rid of paper use altogether resulting in reduction of energy and waste. Digital design offers a highly creative solution to environmentally damaging building and testing processes by transitioning to the use of digital environments. For example, in architecture and industrial design the use of 3D design programs allows the designer to create, destroy, edit and redesign something without wasting raw materials.

## A SUSTAINABLE PROCESS

Applying these sustainable methods and use of materials to the production of my thesis was an important element in the success of the project. I adapted the "11 questions to ask before you design, specify or buy anything" from AIGA's Center for Sustainable Design to include 8 measurable objectives for my thesis project. A few of these questions are quickly answered with the sustainable qualities of computer graphic design and websites.

### Sustainable Production Objectives:

01. Is this component essential to the project?
02. Is the project designed to minimize waste?
03. Can the project be made from fewer, recycled and/or reclaimed materials?
04. Is it designed to be multi-functional?
05. Does it use renewable resources?
06. Is reuse practical and encouraged?
07. Is it developed by a socially and environmentally responsible individual?
08. Is production local?

## Process

In response to my findings in computer graphics design and graphic design, I applied sustainable methods to further support the message of my project. I purchased 100% recycled paper made from 30% post-consumer waste. In addition, I used what paper products I already had as well as reusing and old three-ring binder for keeping all my notes and other collected materials in one place. I kept most of my data collection digital instead of printing out every website or article that was important to my research. At the culmination of my research I scanned all the necessary notes and sketches and then recycled all paper materials. Data was stored on my energy efficient iMac desktop computer and backed up on a second portable hard drive. Meetings with committee members were kept local and central to Rochester Institute of Technology's campus so there was no additional travel required. Purchasing offsets through my web host can help combat the footprint of my total energy use for the project. Including a print-friendly option for minimizing paper waste for every webpage created using simple CSS styles is another way of reducing my project's carbon footprint.


**Image D.1**
*Common Approval-Seals*

With computer graphics and the web being the medium of choice in presenting my message on sustainability, a major contributing factor to the overall environmental footprint of the project was how the project website would be maintained and where. Web hosting companies require a lot of energy to perform. I researched several web hosting companies and compared their claims for environmentally responsible practices. The efforts taken by "green" web hosts usually contain the combination of using alternative/renewable energy, purchase of RECs (Renewable Energy Credits) to power their data centers and offsets (Emission Reduction Credits). Some companies even offer tree planting programs and free web hosting for not for profit charitable organizations. The biggest challenge with this decision is finding the balance between the green energy and practices, dependable service, affordable rates, helpful customer service, and available features.

I decided to switch from my current web hosting provider 1 and 1 Inc. to ThinkHost (a division of Dreamhost). 1 and 1 is moving towards sustainable hosting practices by increasing their clean energy use in their data centers, recycling, using energy efficient office practices, and comes with a super affordable price tag. The overall package ThinkHost can provide outweighs the efforts of 1 and 1 Web Hosting. ThinkHost has a strong commitment to the environment and social change. Hosting plans are 100% powered with renewable sources like wind and sun. They use little to no paper products, storing their data electronically and implement a recycling program. Employees of the company also take action through telecommunication saving in fuel. They also support non profits and progressive companies. I am proud to use their services and support their environmental initiatives.

## ENVIRONMENTAL EDUCATION & INTERACTIVITY

I searched for website examples of education on environmental issues to evaluate what elements are successful and what is falling short in areas of information architecture, layout, graphics, interaction design, and content. My goal was to learn which topics of sustainability are frequently covered, what topics are missing or difficult to find, and identify the holes in the information available. Reviewing these examples quickly led to concept development for my thesis. The following are examples of resources that had direct impact on my thesis.


**Image E.1**
*The Good Life Home Page*

The first example is the Save Our Climate Application from the website for the World Wild Life Foundation at http://thegood life.wwf.ca that is no longer available online (See Image E.1). The site presents information about their global warming campaign and promotes taking action against climate change via a fully Flash-based interface. The interface is clean and elegant and promotes the vision of a clean and thriving environment with the use of earth tones and a background depicting a field of green grass, trees, and a brilliant blue sky. One drawback to the site is the lack of immediate interactivity with the user. The site promotes change with several options: signing a petition, email a friend, and letter writing to the government. The information is text heavy and requires the user to read their tips, blog, and brief descriptions of the campaign. Animation, diagrams, banners, icons, and games are things I believe would help the overall effectiveness of the website.


**Image E.2**
*Recycle Now Home Page*

Recyclenow is a the official website for the UK recycling campaign, part of WRAP (Waste & Resources Action Programme). The website www.recyclenow.com is good example for the United States to follow in regards to promoting domestic responsibility for a global situation. This site represents a friendly user experience. The obvious and expected choices in layout and aesthetics promotes usability and reflects environmental connotations. Information is clearly presented and easy to find, essential for the topic of recycling. One of the main themes is the importance

of children being involved in recycling from an early age. This theme is supported by fun and colorful graphics as well as easy to follow DIY projects, interactive games and animation. The "Schools" section of the website that includes poster and sign downloads, e-cards, video, calculators, and lesson plans, influenced the interactive content of my project.


**Image E.3**
*Example of Icons*


**Image E.4**
*Example of Infographic*

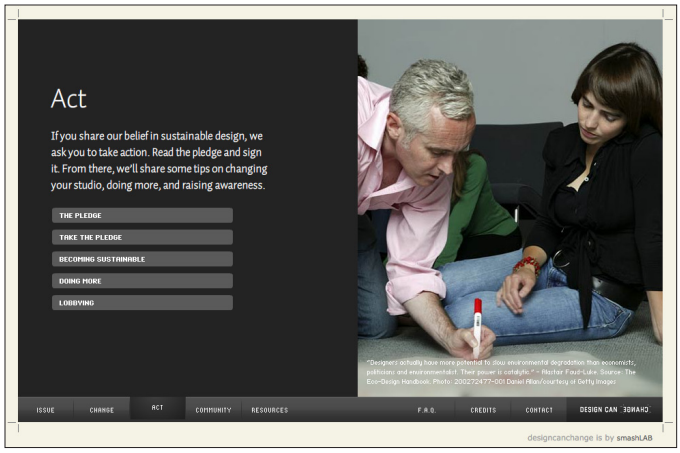



**Image E.5**
*Example of Photography*

Design Can Change is a project by smashLAB, a digital agency that concentrates on website design, social media strategy, and online marketing campaigns. Spurred by the agency's realization of how much waste is generated by graphic designers, the project is an initiative aimed at uniting the world's designers to combat climate change. The project is divided into five sections including: Issue, An overview of Global Warming and facts on the impact of Climate Change; Change, Why designers need to make change and information on current efforts; Act, Actions Designers can take to be sustainable and ways to promote the effort; Community, Directory of designers and supporters of the cause; and Resources, projects, links, tools, and downloads all about climate change.

The minimalist style of illustration with simple shapes, clean white icons on a vibrantly colored background was impactful and inspired the overall visual direction of my thesis (See Image E.3). Select pages have stock photography and others are heavy in infographics and animated sequences (See Images E.4, E.5). Although the illustration alone complemented the message of the project, the combination of illustration style and professional stock photography appears disjointed and adds distraction to the message of the application. The two different styles and contradiction in imagery makes it difficult to determine progress through each section of the project.

**Process**

Navigational elements guide the user into interacting with a menu along the bottom of the application that has a sub menu of additional options. Upon selecting a general topic, the user is presented with a second submenu as well as the option to pan the current page from left or right to view more panels of information. The sliding panels influenced the layout of my thesis because the movement draws parallels to a sense of progression. However, the multiple levels of navigation are not organized effectively in an intuitive layout. Important sections of information that should be directly available are buried deep in the hierarchy of the application. After review of this project it was evident that strong Information design is the key contributing factor in communicating a complex idea such as sustainability with clarity and precision.

The resource-rich project offers the unique perspective of designers and discusses specific and quantitative efforts for change. Focusing on one topic related to sustainability creates a more manageable body of material to be digested by viewers. Design Can Change clearly expresses how designers play a major role in business and consumerism. Providing education and resources on how to design with more sustainable practices, designers can make more positive change from the beginning rather than putting a band aid on the problem or system later when it will fail. Alastair Fuad-Luke, author of *The Eco-Design Handbook* believes "Designers actually have more potential to slow environmental degradation than economists, politicians and environmentalists. Their power is catalytic." In my opinion, it is the responsibility of designers to educate others on their work methods, behaviors, and business practices.

Designers need to inform their clients and end consumers on how their services and products are more sustainable and why it will benefit them. If the client or consumer is not transparent to the process how are they supposed to make an informed decision that will positively affect the next generation. Informing consumers that products like their favorite t-shirt begin not in the store, but at the first stage of the product's lifecycle, they can form a knowledge base that leads to an awareness of the connection between what we buy and the effect of those purchases on the environment. This knowledge can lead to a belief that their actions can make a difference and lead to beneficial changes in consumption behaviors. Consumer choices make a difference in creating a more sustainable society because markets respond to demand, as determined by the law of supply and demand. Consumers can learn to push for change, especially when consumption is leading to natural resource depletion and climate change.

Design Can Change is efficient in the use of multimedia as a tool for education. The application uses persuasive design as an agent for promoting change in user's behavior based on their interaction with the project. Stanford lecturer and researcher BJ Fogg has "isolated more than a dozen principles of persuasion, and grouped them into three main avenues: tools, media, and social actors." Pictures, illustrations, animations, icons, galleries, directories, and an interactive toolkit are the types of persuasive content that I determined to be essential for spreading a message to the masses. However, instead of targeting only a small sample of the population, focusing efforts on the opposite perspective has the advantage of impacting a broader audience. Targeting the consumers on the end of the product lifecycle provides an opportunity to promote and support the sustainable practices that are gaining momentum in the design stages.

## SUSTAINABILITY & THE TEXTILE INDUSTRY

Original project Ideas remained central to the user designing a product cradle to cradle while digesting the topic, putting the idea into practice in order to develop a habitual way of thinking about their own consumer choices. The main challenge at this point was deciding between putting focus on an industry known for their eco-friendly practices or an industry known for their environmentally damaging practices. Since the project is a challenge for the user to make sustainable choices, it was essential to set requirements.

### Subject/Topic Requirements:

- A highly relatable product or service
- Highlight areas of concern in relation to business practices and industry standards
- An industry with a variety of choices in production and manufacturing for lifecycle assessment


**Image F.1**
*Luxury Redefined Project Details*

My project will focus on the lifecycle of the t-shirt, dissecting the entire process from source materials to the eventual disposal or repurposing. The user has the opportunity to design a shirt and make all the decisions that comprise its lifecycle while interactively learning about sustainability. The Perfect T-Shirt Project (Later dubbed "Luxury Redefined") from the company Better Thinking solidified the selection of the textile industry and the t-shirt as the connector and facilitator to making sustainable choices a part of everyday behavior. Better Thinking is a branding company that focuses on "balancing the needs of the planet, people, and profit" and defines Luxury Redefined to mean "you can help to create a sustainable future, without compromising your individual style or standards." What better way to "advertise" sustainable living than with a t-shirt.

This walking advertisement got its start in 1919 as men's undergarments. The clothing article got its name from the T shape it forms when laid out flat. Once a blank white canvas, it now a medium for self-expression that comes in a range of colors and printed with any combination of words, slogans and images you can imagine. You can wear or buy t-shirts practically everywhere and these days its hard to find a charity or promotional event without a freebie t-shirt. Sadly, it takes approximately 1/3 of a pound of pesticides, herbicides, and defoliants to grow enough cotton to make this garment. Few people take the time to consider what effect this wardrobe staple has on the environment. In truth, many people buy products with no thought at all about where they come from.

**Process**

Better Thinking researched every social and environmental effect in the context of the t-shirt's lifecycle. People ranging from professionals in the textile field, to farmers, to the general public contributed to the data collection through interviews and forums. Information was categorized according to Farming/Production, Processing, Printing, Point of Sale, Use, End of Life, and the Office. The methodology and organization of research associated with "Motivating Change" was directly derived from this model. I continued my research on this very complex industry and it's practices and developed a specific method of organizing my directory of websites, case studies, news articles, photographs, illustrations, graphs, books, and other media. This method proved successful in helping my comprehension on the topic of sustainability and turn the huge amount of information into a simple presentation of interesting and relatable content for my thesis.

**Organization of Data Collection:**

- Lifecycle (Fibers, Inks, Printing Process, Dyes, Packaging, Buying, Care, Disposal)
- Visual Inspiration (Images, Infographics, Charts)
- Standards (Impact, Standards Guides, and Sustainable T-shirt companies)
- Tutorials (E-cards, Flash, T-Shirt Designer)

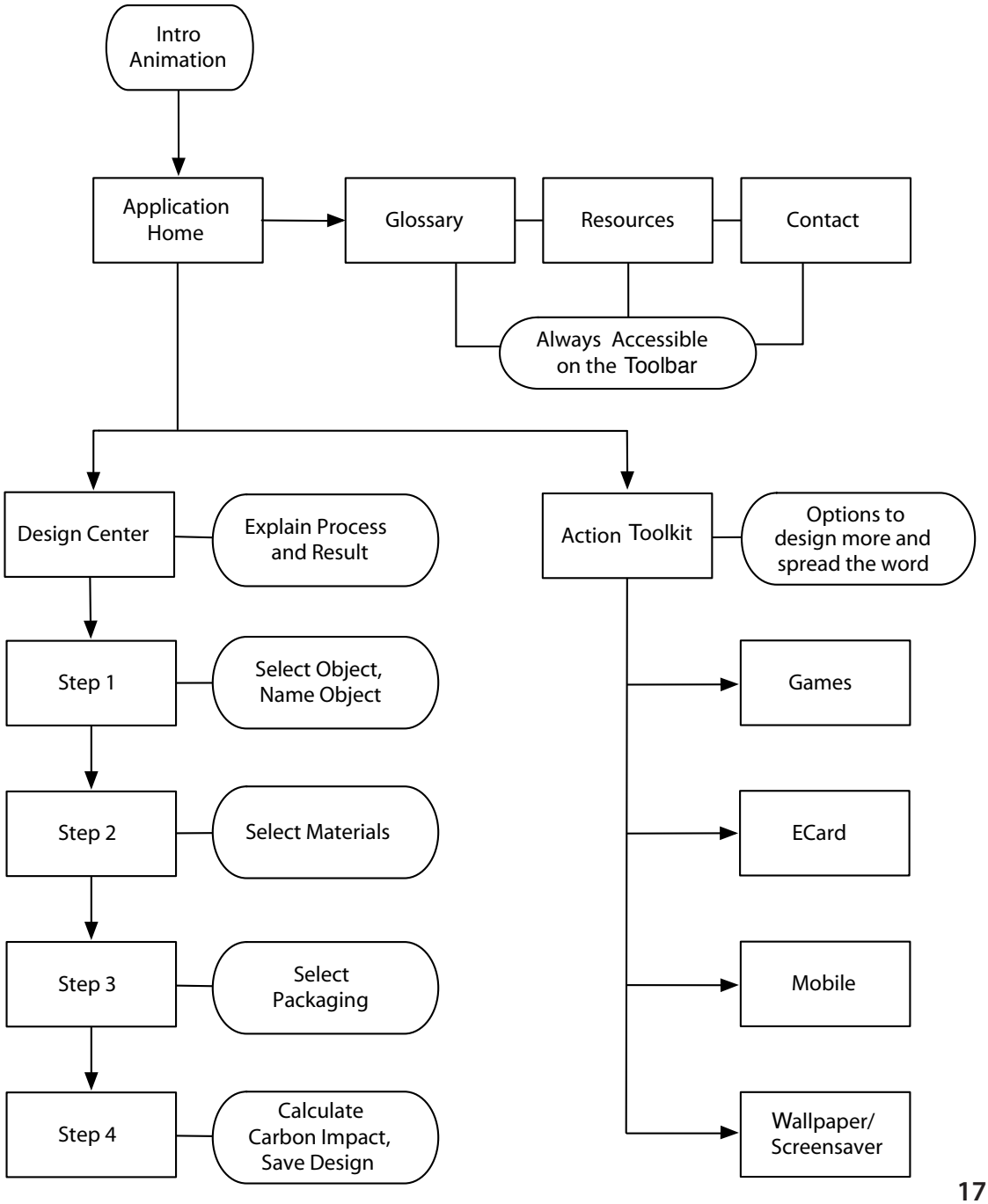
Through the collection of resources I closely traced the t-shirt, assessing the stages of its lifecycle. This strategy provided a closer look at the energy, materials, and solid waste that are involved in its creation. When asked "Who made your t-shirt?" Economics professor Pietra Rivoli responded with her book, *The Travels of a T-Shirt in the Global Economy: an Economist Examines the Markets, Power and Politics of World Trade*. It tells the journey of a t-shirt as she follows the garment's life cycle from its beginnings in a Texas cotton field, to a Chinese textile factory, back to the United States, and eventually to a used clothing market in the East African nation of Tanzania. Rivoli explores the business, economic, moral and political complexities of globalization by humanizing the people involved in the life cycle of a t-shirt. At every turn in the textile industry their is someone or something else to consider. As part of my thesis there will be options presented to the user for them to decide the more sustainable choice, learning that there may not be the perfect product but a product made with the best options available that balance ethics with convenience and the bottom line.

The textile industry is well-known for their environmentally damaging practices. There is an endless supply of solutions (eco-friendly and toxic) for farming, production, use and disposal that all affect its environmental impact. The team from Better Thinking make a disclaimer for their project saying, "The perfect t-shirt is something of a controversial title: until every material, tool, energy source, transport method and person involved in the project has an environmental footprint of zero and an impressive social record, the t-shirt will be responsible for some kind of impact." A truly sustainable product can only be possible if every material, production and manufacturing process, energy source, and person involved leaves no carbon footprint and operates using fair labor and trade. The tee must be crafted from environmentally friendly materials grown locally and naturally with no pesticides, colored with plant based dyes, and manufactured using sustainable processes. Very few products are perfectly green, the key is to focus on what is the greener or more sustainable choice.

## LAYOUT & STRUCTURE

I worked to develop a flowchart, providing a general overview of the scope of the project. I had a difficult time deciding between structuring the project more like an application or a website. I decided to divide the project into two main sections, a design center and a green action toolkit. These two action-based sections would be complimented with supplemental information for the user. A glossary would be comprised of relative terms and phrases related to sustainability, computer graphics design, and the textile industry. Books, articles, video, and other media would be made readily available for the user to continue their own research and environmental education. My goal was the make the user's transition from my own project to similar projects easy and discoverable. The following chart shows a flow of content intended to act as a bridge to more information, generating a desire to learn more and do more, allowing the user to take action.

**Project Flowchart:**



## Process

From the framework of the flowchart came the skeleton of my site. I started with sketches to visualize the layout, blocking out where the information should go. From these sketches I produced a wireframe for the layout and design of the site. I referenced websites related to both sustainability and t-shirt companies as well as generic business templates for ideas.


**Image G.1**
*Educational Layout Example*

**Image G.2**
*Project Layout*

### Goals of Information Architecture:

- Legibility
- Logical division of content
- Attention to hierarchy
- Usability

I approached the layout with a grid-based structure. Information was clearly separated into a header, two main content areas and a footer. One goal was to make it easy to identify navigation to find the appropriate content quickly. It shouldn't matter if the user is at the beginning of their sustainability journey or already on the way, they will always be able to find what is needed quickly and easily. The use of graphical icons accompanied text for the navigation. Each section had a different icon that visually represented the content. In the process of making many preliminary sketches (Refer to Appendix for examples) I determined the main sections of the site to be a Design Center, Green Action Toolkit, Resources, Contact, and a Home Page.

The Design Center allows the user to design a t-shirt in a more sustainable manner. The user will be given a choice of fibers, design elements (size, dye options, inks), packaging, and distribution options. The action toolkit is a supporting section that the user will explore only after the completion of the design center. This section is also very heavy in design elements but will allow the user to share

his or her creations with other people, spreading the knowledge and taking action on a personal level. The user will have the opportunity to create an e-card, download banners or badges from a small gallery, play games, search for answers to their sustainability questions, and access mobile downloads. I decided to outline the content, breaking down my research into manageable parts by separating the information into sections with individual key points. Please refer to the Appendix Section for the original bulleted project outline.

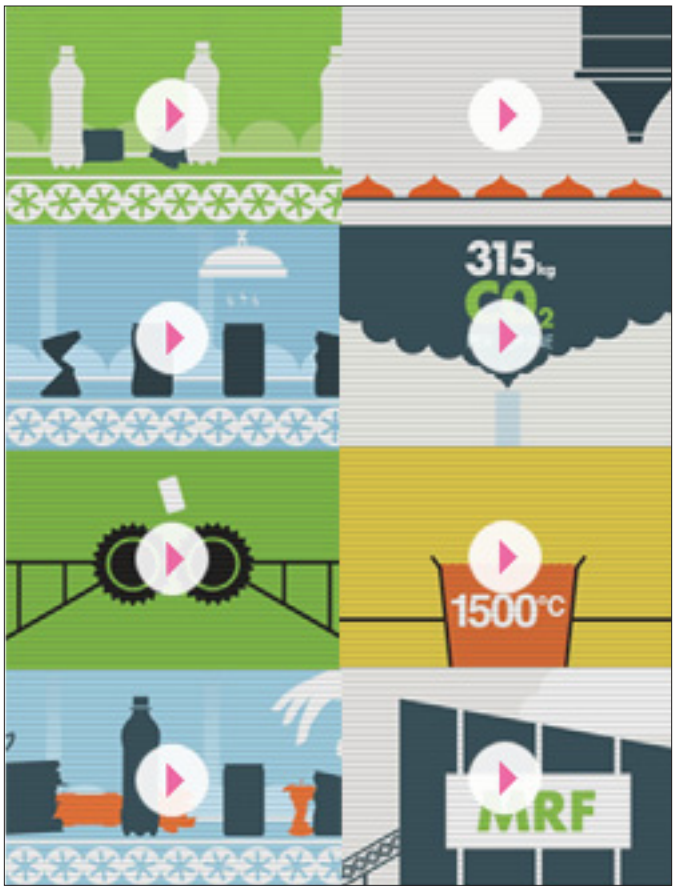



**Image G.3**
*Recycle Now Video Frames*

The intro animation was inspired from concepts shown in other animations like *The Story of Stuff*, and the informational videos found on recyclenow.com in the "How is it Recycled" section (Refer to Image G.1). These are successful examples of using video/animation for educational purposes. My aim is to communicate in a few short seconds all the stages of the lifecycle from extraction to disposal. This method introduces the user to the project's content, visual style, and overall tone quickly and efficiently. Animation is a way to immediately draw in the user when they first visit the project site. The animation reiterates the concept of what you do counts, the common "thread" of the project. Since there will be users that want to have more control of the site I decided to include an option to stop the video and play it at the own discretion.

The home page houses the intro animation as well as a general summary and purpose of the project and its goals for the user. The user is able to access all parts of the project from the home page. What I call the toolbar contains links to the different sections of the website including: Design Center, Action Toolkit, Resources, and Contact Information for myself and additional NGOs (Non-Governmental Organizations). A secondary navigation bar contained in the footer as well as two designated areas for the design center and the green action toolkit gives the user multiple ways to easily find the information they need.

The Design Center is divided into five steps that guides the user through the project in a linear progression. This section is presented in the form of multiple choice, and adds interactivity at the stage of design with a t-shirt designer. The user should first be presented with an overview or explanation of this part of the application, emphasize the goals of application (assessment), and communicate the Five R Framework (restore, respect, reduce, reuse, recover). The user will be given brief instructions for their next steps

to get started. As with any test, survey, video game it is important to instill a sense of accomplishment and progression. I decided to visually represent their current position in the project in relation to completion through a progress indicator. In effort to encourage more sustainable choices and to offer immediate reaction to their selection their will be a carbon footprint meter to evaluate their actions.

The first step in the design center focused on the source material or the stage of "extraction." I introduced a question about fair trade certification and the different options available for fibers. Information on experiments with corn, soy blends, and other "techno" types of fibers were excluded due to their trendy nature. Instead there were multiple viable options like standard grown cotton, organically grown cotton, bamboo, and hemp. Water use is a very important stage because it contributes significantly to the overall footprint of the t-shirt. The user is presented with the options of groundwater, runoff rainfall, and other artificial irrigation systems. The final question related to source materials is on the farming and harvesting stage of the lifecycle. They have the choices of picking the plant by hand or by mechanization (tractors, or other machinery). Also, they will need to decide to use petroleum based chemical fertilizer, other pesticides, herbicides, or go organic in the growing process

The second step involves the stages of "Processing." This stage of the lifecycle traditionally involves a lot of chemicals from dyeing, bleaching, printing, and fabrication. The user has the opportunity to make change to this process by making more sustainable choices. They are asked to determine whether their shirt will by dyed using EPEA approved dyes, non EPEA approved dyes, or if they will leave the yarn or fabric in its natural state. If they do select to have a dyed t-shirt there are also the options of whether the dye will be heavy metal free and if it will use chlorine bleach or formaldehyde in that process. When printing their shirt with a design there are options of the more eco-friendly water-based inks and the toxic VOC filled plastisol. Each choice will make the eco-meter go up or down based on the sustainability of the selection.

The "Design" stage offers a variety of choices in layout, colors, eco-friendly sayings or messages, and iconic images. The user controls placement of images and text through drag and drop, and text entry controls for scale and rotation. The result is a t-shirt of the user's own design that expresses an eco-friendly message through its appearance and construction. Longer messages require more ink and can cause a higher footprint. The user needs to consider whether a choice of no message or image outweighs the message of sustainability that a printed shirt physically displays. Questions for the user to consider include: Does the image support your message? Does placement support the message and readability of the shirt. Smaller text may come with a smaller environmental impact but if its unreadable the social impact could suffer. When the user is confident in their design they can progress to the next step.

Working conditions, energy use, production, packaging and labels, transportation and waste comprise the fourth step, "Manufacturing." Based on how the user's choices effect the eco-meter, the user will be able to determine if their t-shirt is environmentally friendly. The following are sets of questions the user may encounter at each stage in the manufacturing process.

**Process**

*Working Conditions:* Consideration of the working conditions factory workers face has both a social and environmental impact. The user will be asked a question about conditions. *Production:* Local, domestic, and international production are all considerations. A single location is more efficient than multiple locations for all the stages of manufacturing.

*Waste:* There will always be leftover materials and resources after a product has been produced. Will scraps become fully-fashioned or are there options to recycle, reuse, or dispose of this waste? What is being done with the leftover chemicals and is the wastewater recycled in process?

*Packaging & Labels:* For the packaging of the t-shirt there could be options of paper, foam, and cardboard. Some of the materials could contain a percentage of post-consumer content or be recyclable. The user will be questioned if it is reusable, recyclable, biodegradable, or a single use package. Another factor is how much packaging is used in shipment.

*Transportation:* The options for shipping include distribution by land, air, and water. The farther the product has to travel the more environmental impact it has.

*Energy Use:* Energy is another contender for being the most impactful element of the manufacturing stage. The user will be given the choice of several renewable energy sources like wind farms and solar power, in addition to damaging fossil fuels.

"Aftersale" is the last step in the application. This stage in the process generates the largest part of the t-shirts footprint. Garment care requires a lot of energy and water. The user will choose between using the standard energy wasting washing machine and dryer, energy efficient washing machine and dryer (energy star rated), hand washing the garment using eco-friendly detergent and air drying. There are many available options for disposing of your t-shirt. There are several companies that have clothing drives or you could hold a garage sale. There is the option to give it to a second hand or vintage clothing store like Goodwill or Salvation Army. A shirt can be reused for something else like cleaning and painting. The user could also decide to just put their shirt in the trash ending up in another landfill. Shirts can also be composted, decomposing back into the ground.

The "Action Toolkit" is the other main section. This section features an e-card with four template options that the user can customize with a personal message and then send to their friends or family. All four e-card designs complement the design of the website and help spread the message of the project. Several web banners or badges are available for download to be put into blog posts, used in social networking applications or on a personal website. Other downloads include icons of the project's logo and a green guide for the user to reference for green living information. The guide includes: sustainable design checklist, starting a campaign, creative events, working with the media, sample letter sample petition, sample press release, and an organic t-shirt company list. There are also educational interactive flash games for the user to learn more about sustainability. One is a matching game that provides more information on the most eco-friendly fibers like organic cotton, soy, or bamboo. The second game is based on recycling and challenges the user to recycle and save waste from the landfill. This section of the project is based on the concept of grass root advertising designed to grow and be passed on.

**Process**

The "Resources" section was originally going to be a FAQ section to answer questions on sustainability and offer a glossary of relevant green and printing terms. I decided that putting just a sample of the information in front of the user does not encourage taking action. Instead my solution was to provide links to helpful websites, articles, videos, and other media to promote exploration of other projects to find more information. At the bottom of this section there is a Green Maven Search Wiki that allows the user to search for information that they need but cannot find in the project. The search redirect the user to a "green" Google search that produces sustainability related results.

The section for "Contacts" serves two purposes. There is a form for the user to send me their email address, feedback or any other message. There is also additional information for contacting non governmental agencies that are working on critical issues related to the textile industry. An important part of change is voicing your concerns to people and organizations that can make big impact.

## VISUAL STYLE


**Image H.1**
*Project Logo*

The application required a clean, friendly and elegant visual style to convey an approachable and fun user experience. I began with sketches of the user interface that were derived from my original wireframes (Refer to the Appendix for Sketches). After all the information was blocked out and the sections of the website had a defined layout I needed to create an overall visual style for the website. The first step was developing a logo and the name for my thesis website. I tackled this challenge by making extensive lists of the green words, terms, and trendy taglines I came across in my research. I ultimately decided to stay as close to the core message of the project and moved forward with the URL of Sustainabilitee.info which is a combination of the words sustainability and teeshirt. The term is also a clever spin on the spelling of sustainability. I used the info domain to further communicate that its an educational website filled with resources. While designing the logo I avoided the world, tree, plant, and leaf motifs made cliché through greenwashing. I was drawn towards the fun style of illustration as opposed to the cold corporate feeling stock photography can evoke. I did several drawings of t-shirts, some photo-realistic and others simple outlines of the t-shirt shape. After many versions I settled on a whimsical green t-shirt logo that set the stage for the rest of the visual style and aesthetics of the website. There are several visual elements that immediately associate this project with environmentalism like colors and graphics. In support of eco-related issues I populated the interface with vector illustrations, and icons that reflect themes of energy, recycling, and growth.

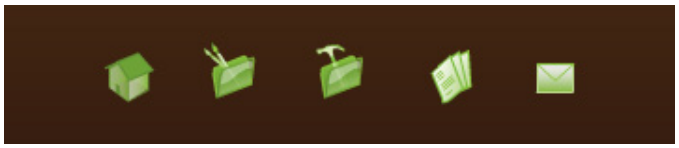


**Image H.2**
*Navigation Icons*

Not only can illustration establish the branding of the project but it can also set the mood and characteristic of the site. My goal was to present a very friendly yet professional image by using simple illustrations. I found inspiration in other simple shape based illustrations with thin line qualities. I strongly considered going with more of a sketchy hand drawn look like in *The Story of Stuff*, but

**Process**

ultimately went with a hybrid of 2D and 3D similar to the style of Carbonica.org to reflect a more interaction centered interface. The solid color fills mixed with slight gradients and shadows give the images a faux 3D appearance. I also used the technique of layering and mixing 2D and 3D to give it a scrapbook or cut and paste look. This style of illustration is consistent for all of the iconography of the site. The icons in the interactive navigation menus have subtle animations on rollover encouraging the user to interact and explore the rest of the website. Creating a similar effect, panels within a page slide on and off in an easing transition from one section to another section. The sliding panels of information are meant to replicate the movement of an assembly line, progression through the project, and the journey of tracing the lifecyle of a t-shirt.

**Image H.3**
*Background Illustration*

A prime example of using computer graphics to communicate the ideas behind the project is the illustration in the background layer of the website. The landscape illustration is divided into levels, each a visual representation of a stage in the lifecycle of a t-shirt from extraction to disposal. The background illustration is the first graphic the user experiences when entering the site. The user gets a few seconds to digest the topic while the Flash application loads and the intro animation begins and builds on the original foundation. One adjustment I would like to make to this background is adding in a few subtle animations that loop continuously. Simple movement like water drops falling, a train moving across the page or the shirt swaying on the drying line would add even more visual interest to the interactive interface and help communicate the message of change.


**Image H.4**
*Style Frame*

Although a picture or illustration is has its merits, in some situations, they are not sufficient to describe something like the lifecycle of a product. An animation or video is necessary for the user to better comprehend this whole process from cradle to cradle. Adding animation to the website was important to grab the attention of the user, demonstrate the topic of the project, and add to


**Image H.5**
*Style Frame*


**Image H.6**
*Style Frame*

the entertainment value. The introduction animation is done in bright colors and 3D with vector illustrations describing the lifecycle of a t-shirt in 5-10 seconds. The animation is comprised of the same simplistic illustration style with 3D text highlighting each part of the lifecycle. The introduction animation is defined by its simple movement, clean lines, and fast but smooth transitions. This is an important and dominating visual element that adds a layer of motion and that really brings the illustrations to life. The frame is held straight and steady looking onwards as the earth rotates each stage of the lifecycle into view. The music is a composed of similar looped beats that build to a fast rhythm of repeating beats. The upbeat sound of the music adds to the hopeful and positive tone of the rest of the website. To avoid frustrating or distracting the user, customized player controls are provided to give the option of stopping the video when going between the home page and other sections of the site.

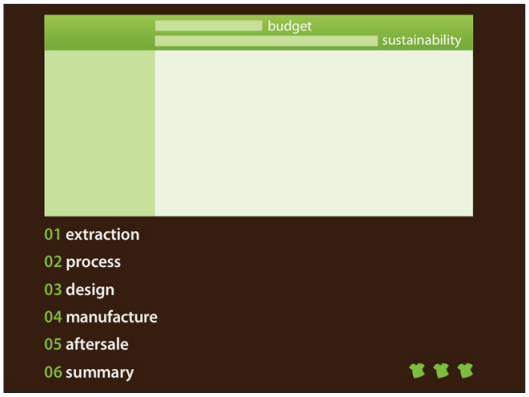
Serif fonts like Georgia fueled my original ideas. After further conceptual iterations I concluded that sans serif fonts were better suited for the project. Gill Sans and Impact are two fonts that can be found in my proposal materials, original layouts, and my blog following the process of the project. After failed attempts in rendering these fonts successfully in flash it was clear that I needed a more modern font that was simple, clean, versatile, and easy to read. The font family used in the project is Myriad Pro with the weights of bold, semibold, and regular. The font was chosen for its simple, clean, and professional aesthetics in combination with high eligibility on contrasting colors. Myriad Pro looks great at a wide range of sizes and translates well into a 3D treatment in the intro animation. Looking back I would like to have incorporated a second or third complementary font with similar line qualities and contrasting textures to parallel the complexities of sustainability. Creating more typographical friction would have added to the website a feeling of durability and energy. After deploying the website there is one change I would make regarding the text of the site, making it all selectable flash text.

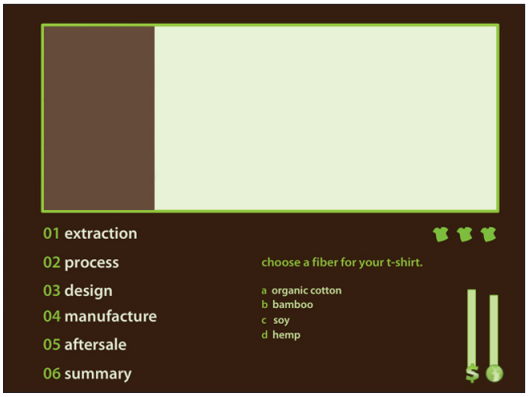
The application has a palette of bright green, rich brown and lighter and darker hues of both colors. I decided against using clean bright whites because white is meant to

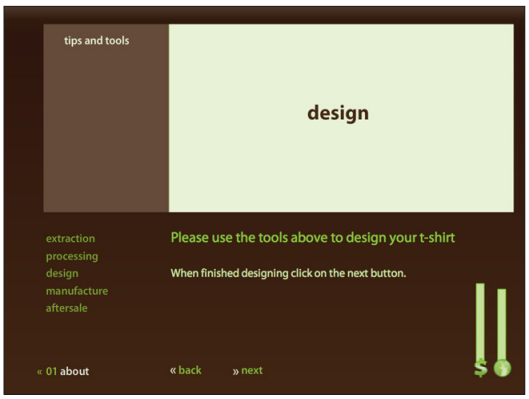
represent neutrality and pureness. The mental image of plain white t-shirts is deceiving because the current state of the textile and t-shirt industry is far from clean and pure. I didn't want to further support the misleading outward appearance of those t-shirts. Instead, I selected colors that I think represent the topic more faithfully. The color palette was comprised of colors associated with the environment. The selected earthtones reinforce the fiber to final product model, symbolizing a "light green" application. The color green affects us physically in a variety of ways. I want to convey the soothing, relaxing mentality that offers a sense of renewal. The browns represent the earth where the product begins its lifecycle. It is the color of our earth and is associated with all things natural or organic. Brown expresses a sense of reliability and approachability that is well suited for an educational application. On the opposing end, browns also have the connotation of dirtiness, symbolizing the impurities of the processes and decisions associated with bringing a toxic product to market.

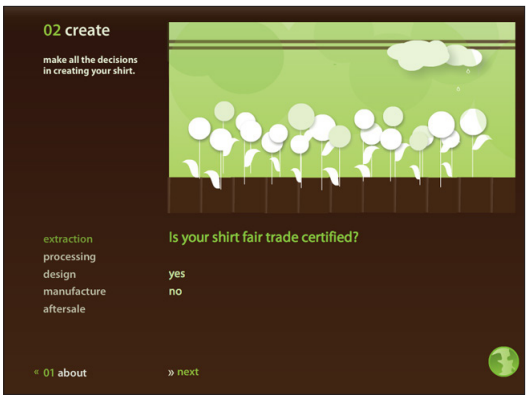
The Design Center posed the most challenges in layout and design. Multiple change in the navigation of this section required major changes in the hierarchy of information. The original designs were based on a more tool and function based layout. However, I wanted to tell more of a story with the navigation and graphics. As a solution I used an assembly line to communicate the lifecycle of a t-shirt. The first idea was to have both a meter for budget and sustainability. Instead, I rolled both ideas into one meter because not all the question related to a monetary value. The end result was a well balanced, graphically interesting design based on the two column system consistent with the layout for the rest of the pages.

### The evolution in design of the Design Center:




**Images H.7,8,9,10**
*Design Iterations of the Design Center*

**Process**

Another problem I had was merging existing company logos for the resources section with the look and feel of the website. There was a mix of vector graphics and bitmapped images that were not complementing the clean and elegant page design. First I tinted the graphics to green and brown tones but it was unsuccessful. Instead of using existing graphics I resolved this issue by creating icons to represent the resources. I used different icons for each media type: books, websites, articles, and video. Popup tool tips informed the user of the title and location of the resource. Another change was made to the footer at the bottom of the page. The FAQ section was removed and replaced by a more dominant search feature. The user can use the search function to answer any questions or find more information on green issues via the green maven search powered by Google.

### Design challenges of the Resources section:

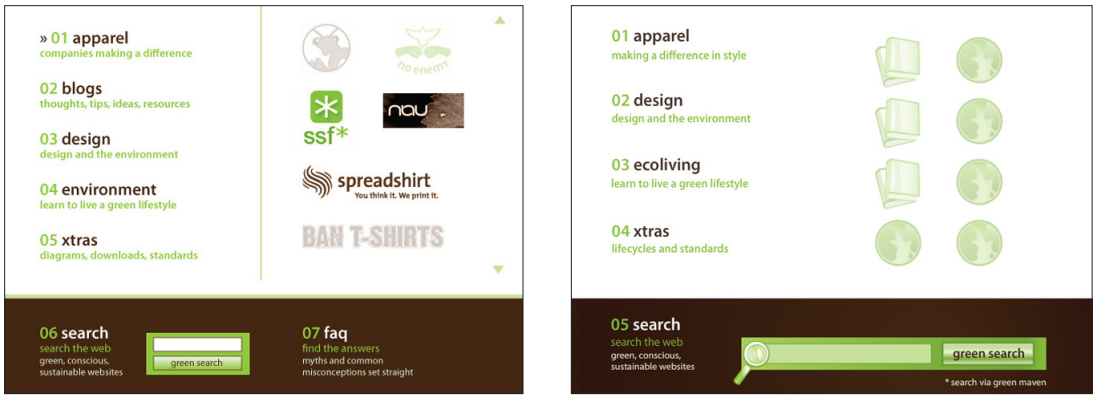



**Image H.11,12**
*Design Iterations of the Resources Section*

For the Action Toolkit I had considered producing videos that gave the user green-living tips, ways to reuse your t-shirt and ways to calculate your own carbon footprint. I decided there were already many websites that already offered such videos. As a solution I could easily link to these videos in the resource section with the same effect. I wanted a more interactive approach to learning. I concluded that interactive flash games would both involve the actions of the user and provide valuable information on issues of sustainability through computer graphics. I designed the games in styles that parallel the website but are different enough to create a stand alone identity for the flash games.

### Change in media type for the Action Toolkit:

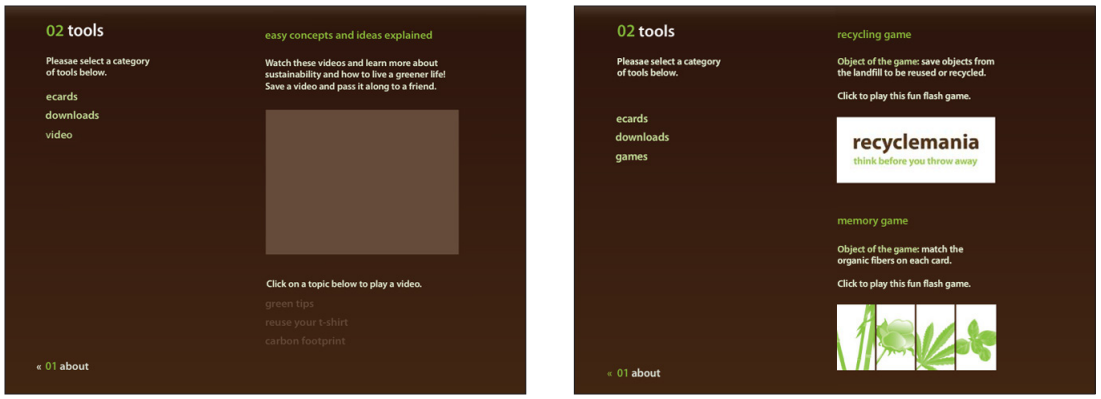



**Image H.13,14**
*Design Iterations of the Action Toolkit*

## DEVELOPMENT

I had intentions to construct my project in Flex after seeing a captivating demonstration of the software at an Adobe sponsored meetup. With its new release I was excited to try out the software and experiment with my ideas. However, after weighing the pros and cons of the program I realized there would not be enough time to learn new software plus there were few resources available for support. With the abundance of great resources and existing project examples I came to the conclusion that Flash would be the better choice. Adobe Flash Actionscript 3.0 was the key technology along with PHP, XML, HTML, and CSS. I've used Adobe Photoshop, Adobe Illustrator in creating the graphic elements and Maya and After Effects for the intro animation.

The first coding obstacle was making the top and bottom navigation properly direct the user to the correct page. I encountered a few issues with the navigation in attempt to combine the rollover animations with sliding in page panels. To resolve jumping icons and looping animations I redid the animation to include a stop command. I restructured the navigation of the site by creating a public class for the main navigation to avoid having to access the main project timeline from within the same class. I used Tweener, a class for Actionscript 2 and 3 for easing animations. This class was developed for public use by developer Zeh Fernando. According to the Tweener documentation, "Tweener isn't just a class used to create just animations. It's, instead, a class used to create transitions - doing tweenings on any numeric property of any object - which can be used for many purposes, including visual animation." Using this class was an efficient way to animate all startDrag() and stopDrag() elements of the website.

For the Resources section I first attempted to load in the icons and tooltip text through XML. Since the icons would remain the same I decided that loading them dynamically in Flash using an array was the better option. It was far more likely that the locations of the resources would be updated and it would be easier to change that information in an XML file. At first, tool tips were displaying on screen in random locations with no relationship to the rollover icon. This problem was resolved by setting specific x and y positions based on the cursor's location. The green search feature at the bottom of the Resources page had to be integrated with Green Maven, the world's first comprehensive Green Search Engine built with Google's Coop Search technology. Rather than searching the entire web, I was able to utilize their search engine to yield only "green" results. Green Maven allows users to install a browser plug-in on Firefox or Internet Explorer that creates a Green Maven search box in their browser toolbar. They also support the option of adding a green search box to personal websites by installing the Green Maven search widget. I wanted the green search to look like an integrated component of the project so I designed my own search that uses PHP to make a URL request on "click" or "enter" based on the user's search text entry to return the same results as the widgets and plugins.

For the Contact page there are two main features, a way for users to contact me with questions or feedback and lists of organizations linked to issues of sustainability. A PHP email form was the obvious solution but I had to switch to a Linux based hosting plan to support PHP. I coded the form to perform similar to the green search feature on the Resources page. The email message was then formatted to include the user's name and email in their message. Form validation provided a solution to inaccurate results based on user error. In prevention of other errors, the email input fields were coded to clear when an

email was submitted as feedback to the user their message was successfully sent. Instead of using XML, the list of NGOs (and link locations) displayed by category were generated by loading in a basic TXT file. The text shown on screen was then dynamically loaded into empty text boxes that were animated onto the screen and then styled by setting the text format in Flash.

The "send an e-card" section in the Action Toolkit was an opportunity to allow users to create, customize, and email online e-cards to spread the message of sustainability. The user was given four design options and then they are prompted to input their contact information and a personal message. The e-card is then sent to their friends, family, and peers and can then be passed on again and again creating a viral effect. To create these e-cards I found a helpful tutorial created by Jeffrey F. Hill from flash-db.com. I was able to easily modify his structure, card messages, and rveplace existing designs with my own to integrate the e-cards into my project. The e-cards required two PHP scripts to automatically create text files to save all of your data by writing them to a directory hosted on a server. The biggest challenge was re-writing or modifying the example files to work with Flash CS3. Most of problems were in Flash but there were also a few syntax issues with the PHP files that I had to correct for the e-cards to work. Most of the issues stemmed from the older var, statements, and strings.

I created two Flash games to include in the Action Toolkit. Instead of navigating away from the project, the Flash games are opened as separate SWF files in new browser windows. For the memory game the cards had to be displayed randomly with each new game using math.random. I also created an animation that simulated a 3D flip when selecting each card. To recognize a match of cards I created a function to check for a match in the card's String values. When the current number of matches equaled the total number of matches it produced a "You Win!" message for the user. For the recycling game I randomly generated values based on gravity and trigonometry to drop trash out of a dump truck to be collected by a recycling bin before it fell into the landfill. I attached a blue recycling bin for the custom cursor. As the user recycled items by catching them, the hit targets of trash items "hit" the hit target of the cursor the item was removed from the stage. If too many trash items reached the landfill, piles of trash were added to the stage until the user beat the timer or the user lost because the trash pile reached too high of a level.

For the T-shirt Designer I needed to dynamically load in several questions per stage of the t-shirt's lifecycle through the use of an XML file. Each answer for each question had a specific value associated with it that effected the sustainability meter, making it go up or down based on its y position. This vital feedback provides the user with real time assessment of their selections. Looking back it would have been beneficial to also give a final "sustainability score" at the end of the section to evaluate all their decisions. The assembly line illustrations also changed based on the questions. As the user goes through the questions the assembly line illustrations act as a cue point for where they are in the process of creating a t-shirt. The design stage of the section allows the user to select images and text to place, scale, and rotate on their t-shirt. I used the startDrag() and stopDrag() commands to place the visual elements. I used the single-symbol method for displaying the images, using one symbol in a movie clip, with multiple frames, each frame with a different image. Rotating and scaling required functions that multiplied the user's number input by a set value effecting its rotate, scaleX and Y values.

**Summary**

User testing was an important factor contributing to the overall effectiveness of the project. Several stages of testing were conducted throughout the research and development of the final application. Testing and reviews took place as soon as a graphical user interface was in place. This first stage of testing included the feedback and suggestions of my thesis project committee and select peer graduate student within in the Computer Graphics Design Department as well as other areas of study such as Graphic Design, Industrial Design, Communications, and Business. This form of usability testing continued to be pertinent in the development of the working prototype.

Usability testing commenced during the final Thesis presentation, where I handed out a two-page survey. Please refer to the Appendix for an example of the survey. The survey is organized in three categories: Navigation, Graphics, and Effectiveness. In review of the project the user is asked to rate the presented question or statement on a scale of 1-5. The scales represent Easy-Hard, Agree-Disagree, and Definitely-Definitely Not in each category. A few questions ask for further details or an elaboration on their answer selection. I was expected to get a ton of useful feedback that I could then put into effect in my next iteration.

In opposition of my expectations, I received minimal feedback that was helpful to the iteration of my project via the survey. In contrast to the simplicity of questionnaires I realized that giving a more detailed guided tour of the application gathered more productive responses. I used this approach for my thesis exhibit at the Computer Graphics Design MFA Thesis Show on May 24, 2008 in the Computer Graphics Design MFA lab at the Rochester Institute of Technology. I had a better experience in explaining the project to a new user because I was able to mimic the real life scenario I imagined for the project, a useful classroom aid for teachers. Through this method I received excellent feedback that went beyond the questions that I had asked. Some comments had me thinking about elements I had not incorporated into my project like saving out data and images for study guides or records. Other people wanted to be able to save their t-shirt designs and be able to quickly and efficiently link to a printer like Threadless.com to produce their creations.

## Conclusion

The intended outcome of my research was to produce a thesis project that centered on goals of education, and communication of sustainability. There is a scarcity of interactive education materials covering the topic of sustainability concerns and sustainable design issues in the United States. Exposure to green design and other topics of sustainability is limited for people of all ages, races, and education levels. With my thesis project I have developed an alternative approach to learning that supplements conventional methods of classroom-based learning. Although the project has broad applicability it is aimed at a younger audience of students. In order to sustain our world we must first be educated on the environment and the effects and consequences of our actions on our current situation and the future of generations to come. Sustainable choices are based on behavior and methods of thinking. The ideal scenario if for students to be introduced to healthy and sustainable living at a young age so they can learn and put into practice their "green" choices and behaviors early for big impact.

As issues of sustainability become trendy, the epidemic of "greenwashing" and misinformation has grown rapidly. One can find a lot of wrong information on the internet and through misleading marketing campaigns and unfortunately there are no universal standards for such terms as "eco-friendly," "organic," "sustainable," "fair trade," and "green." The solution to this gap in information is to offer alternative sources of information like my interactive thesis project that provides factual and helpful information on sustainability and communicates the message "small changes can have big effects". The best possible outcome of this project is for the user to consider the origin of their own t-shirt or the fibers that they are wearing. A simple but highly impactful takeaway from the project is to think more consciously before buying a new t-shirt or any new product or service. Living in a time where overconsumption is the norm, we have an opportunity and responsibility to make a difference. Don't be a mindless consumer and think before you buy something, think before you throw away something, ask more questions, be an informed consumer, and educate others so they too can see the benefits of greener choices. This may sound a bit superfluous, but given the millions of t-shirts and other products sold nationwide, the potential of change is undeniable.

The interactive framework of the project brings sustainability directly to the user in effort to motivate and change personal perspectives and practices. The key component to the success of this project was generating interest and participation of the user. For this project to create an opportunity for change it needed to provide the essential resources for education, promote discussion and interaction, and generate reaction through offering ways to share knowledge and ideas. As a solution to this challenge, the project acts as a stage for the user to play with the games, interactively design a t-shirt, answer questions, find resources, and encourages an overall sustainable way of thinking. There are elements of a grassroots campaign with e-cards, badges, a PDF Green Guide, and web banners acting as vessels for spreading the message. By interactively involving the user in the process of making a t-shirt they are exposed to all aspects of a product's lifecycle including important concepts of energy efficiency, durability, end-of-life, packaging, and use of innovative materials. The user will recognize all that goes into creating a product and the importance of good design and sustainable practices. By assessing the lifecycle the user can know what to demand in their products and services to shape a more sustainable world.

## SELECTED KEY QUESTIONS

At the commencement of this project I set out to answer a few questions to determine its relevance and contributions to the areas of computer graphics design and sustainability. Through research, the design process and implementation of Sustainabilitee.info I was able to answer these questions.

**Question 1:** *How can computer graphics design promote and motivate change in people's behavior in relation to the environment?*

From the beginning the project catches the attention of user by communicating the topic of sustainability with good design, layout, and content. The content on the website is heavily supported by computer graphics to make a connection with the user. The project focuses on spreading a message and providing those who would like to be involved in the campaign a way to spread further awareness. To build critical mass, the best way is through social networking and online mediums that are strongly supported by computer graphics. Simple actions like putting one of the Motivating Change banners on a personal site, and linking to the project can have big impact. If a user has their own blog, they can post about Motivating Change and their individuals efforts to become sustainable. Also giving the user a reason to make multiple trips to your site with interactive components, games, video, and useful resources increases the reach and value of the project.

**Question 2:** *How does computer graphics relate to issues of sustainability?*

Use of computer graphics may be considered an example of sustainable design, reducing unnecessary consumption of resources and production of energy and waste. The technology and process of my project may be considered sustainable with the use of software, the internet, digital data collection and online correspondence. The small amount of waste produced for this project was recycled or reused. The Green Guide PDF was a great example of sustainable graphic design. The document can be downloaded and used in its digital format with no printing. This example proves that design can render services with minimal waste, work can be copied, reviewed, reworked, redone with no printing or physical prototyping. Energy generated through use of internet technologies, computer hardware, and software can be offset or supplied with renewable sources. Since the project is online it doesn't need to be disposed of, recycled, or composted. Moving forward, computer graphics is going to be a major player in sustainable design thinking.

**Question 3:** *How is sustainability a design issue?*

As a designer I have the opportunity and responsibility to enhance the well-being of other people through my projects and design services. According to Re-Nourish, "Design decisions shape the processes behind the products we use, the materials and energy required to make them, the ways we operate them and what happens to them when we no longer need them." By making sustainable design choices we can develop solutions that help people, protect the environment, and grow the economy. My thesis project further communicates these ideas of sustainability and is an example of work in-line with environmental beliefs and values through the use of engaging interactions, vibrant interfaces, and subtle animation. Stunning visual elements, well presented content, and entertaining sounds can turn environmentally-friendly ideas into virtual realities that supply an interactive experience that will leave a lasting impression on the user.

## EVALUATION

The workflow and organizational methods I used were instrumental in creating a cohesive and effective project. My approach to research and structure of the project being based on the lifecycle of a t-shirt was advantageous in breaking down the colossal topic of sustainability into meaningful and discernible sections of information. I know it is essential to approach socially impacting issues with social media. I could have improved on my implementation with the inclusion of blogs, open page commenting, or even a small online community. I learned that a successful campaign/project needs a fully transparent mission and purpose, interactive multi-media, valuable resources, a platform for communication and collaboration, and multiple means of exposure.

In terms of design I believe I was successful in using computer graphics, colors, typography, and other visual elements to support and convey the message of my Thesis. I have developed my own personal style that incorporates simples shapes, modern font choices, and bright colors to create a clean interface with ample white space and clear hierarchical relationships in content. I was satisfied with the quality of animation and graphics on the website. The introduction animation served its purpose of familiarizing the user of the topic when launching the site. Other animation and interactions on the site like button rollovers and navigational elements also added to the total user experience. One adjustment I would make to the interface is to make all text selectable on the website, increasing SEO and making it easier for people to share information from the project.

I adapted and experimented with my workflow among design programs. I became adept at working back and forth between Illustrator and Maya, After Effects and Flash to create mix media illustrations and animations. My skills in Flash and Actionscript 3 have improved tremendously and I can now produce well commented, organized, proficient, and reusable code. The action toolkit is a good example of successful interactive elements in the project achieved through the combination of Actionscript and other key technologies like XML and PHP. The T-Shirt designer is one area that could use improvements in interaction and functionality. I made my best attempt at creating a fun design and learning experience for the user. The quiz is useful for introducing the issues to the user but it could benefit from some sustainable design tips or extra facts on the damaging practices of the textile industry for each set of questions. From user feedback the best suggestion I received was the inclusion of a report or score card when the user completes this section that can be saved or emailed. This feature would offer positive reinforcement for sustainable choices as well as takeaway from the website that could be used as another way to spread the message of sustainability.

This project was an eye-opening experience and was the beginning of my preoccupation with sustainable design and education through interactivity. I owe many thanks to the individuals that have influenced my work and put me on this rewarding path. The lessons learned from this experience have had major impact on my own design career, my outlook on life, and the decisions I make everyday. I have been personally motivated by the positive reception and reactions to my work. I am now dedicated to sustainable thinking in both my personal and professional life and will continue to make valuable contributions to the worldwide discussion on sustainability + design.

Appendix

## DEFINITIONS OF TERMS

In the context of this documentation, the following definitions are related to design, sustainability and textile industry. These words and terms were used in research and production of sustainabilitee.info.

*Design for Sustainable Change* is neither an add-on, nor an elite area of design. Design for sustainable development is the process by which all designers can improve the social, economic and environmental impact of their work.

*Environmental Education* fosters critical thinking of global and regional environmental, political, economic, social and cultural issues in an attempt to encourage the development of problem solving abilities. Establishes a sense of individual responsibility that benefits the environment as a whole and emphasizes active responsibility.

*Carbon Footprint* measures direct and indirect impact human activities have on the climate based on how much carbon dioxide is produced. For example, factors that contribute to your carbon footprint include your travel methods and general home energy usage.

*Green Design* is what links sustainability, creativity, and innovation. It shapes ideas to become sustainable and attractive propositions for users or customers.

*Green Washing* is the phenomenon of socially and environmentally destructive corporations attempting to preserve and expand their markets by posing as friends of the environment and leaders in the struggle to eradicate poverty. - CorpWatch

*Information Design* is the defining, planning, and shaping of the contents of a message and the environments it is presented in with the intention of achieving particular objectives in relation to the needs of users. - ID News.

*Interactive Design* defines the structure and behaviors of interactive products and services, and user interactions with those products and services. - The Interaction Design Association (IxDA)

*Innovation* is the successful exploitation of new ideas. It is the process that carries them through to new products, new services, new ways of running the business or even new ways of doing business.

*Lifecycle Assessment* is the evaluation of the environmental aspects and potential impacts associated with a product, process, or service. Also known as "life cycle analysis", "ecobalance",and "cradle-to-grave analysis." - Thomas Gloria, Ph.D.

*Natural Fibers* are created from fibers of animals coats, silkworm cocoons, and plants' seeds, leaves, and stems.

*Organic Fibers* are raised by following standards that nurture the soil or animal from which it comes and do not use toxic insecticides, herbicides or fungicides.

*Sustainability* Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. - Dr. Gro Harlem Brundtland

*User Experience* "encompasses all aspects of a digital product that users experience directly—and perceive, learn, and use—including its form, behavior, and content. Learnability, usability, usefulness, and aesthetic appeal are key factors in users' experience of a product." - Pabini Gabriel-Petit

## PROJECT OUTLINE, FLOWCHART, & SKETCHES

### Project Outline:

### Intro Animation

- Concept of what you do counts
- Option to skip intro

### Home Page

General summary of the project

*Links*

- Design Center
- Action Toolkit
- FAQ
- Learn More
- Contact Information

### Design Center

7 steps (linear progression) progress indicator, and carbon footprint meter

*Get Started*

- Purpose of application
- Goals of application (assessment)
- Five R Framework (restore, respect, reduce, reuse, recover)

*Source Material*

| | |
|---|---|
| Fair Trade Certified | Yes or no |
| Fiber | Options of cotton, organic cotton, bamboo, hemp<br>Information on new experiments with corn, or soy blends |
| Water | Options of groundwater, runoff rainfall, other artificial irrigation systems |
| Farming/Harvest | By hand or by mechanization<br>Use of petroleum based chemical fertilizer, pesticide, herbicide, or none |

## Appendix

*Processing*

| | |
|---|---|
| Dye/Bleach | EPEA approved, non EPEA approved dyes, or leave yarn in natural state. Are dyes heavy metal free and do they use chlorine bleach or formaldehyde? |
| Ink | Options are water-based or plastisol<br>Information on variations of both ink types |

*Design*

Hints for making eco-friendly choice

| | |
|---|---|
| Colors | Natural colors vs. synthetic<br>1, 2, 4, 6 color printing |
| Fonts | Larger fonts require more ink<br>Readability of the message |
| Message | Longer messages require more ink<br>No message is a lower footprint but will the message of sustainability be passed on? |
| Image | Does the image support your message? |
| Placement | Keep in mind the readability of the shirt |
| Size | Larger=more ink<br>Very small=hard to read |

*Manufacturing*

| | |
|---|---|
| Working Conditions | Recipe for ideal working conditions |
| Energy | Choice of wind farms, solar power, and fossil fuels |
| Production | Local and domestic vs. international<br>Single location vs. multiple locations |
| Packaging and Labels | Options of paper, foam, cardboard, contains recycled and post-consumer content<br>Is it reusable, recyclable, biodegradable, or a single use package?<br>How much packaging is used? |
| Transportation | Options of land, air, and water |
| Waste | Fully-fashioned or Cut and sew<br>Options of recycle, reuse, dispose<br>Is wastewater recycled in process? |

*Aftersale*

| | |
|---|---|
| Garment Care | Choice of standard washing machine & dryer, energy efficient washing machine & dryer, hand washing, detergent, air drying |
| Disposal | Options of clothing drive, landfill, reuse, compost, send to a recycled clothing company |

*Summary*

| | |
|---|---|
| Carbon Footprint | Score based on combination of all choices, is this t-shirt green or not? Overview of your choices |
| Save Image | Option to retain your custom design<br>Go to Action Toolkit |

## Appendix

*Action Toolkit*

- Add This (social bookmarking widget)
- E-card
- Logo icon link
- Mobile download
- Games
- Web banner

*FAQ*

Include major green and printing ideas

- Carbon footprint
- Global warming
- Fair trade
- Green washing
- Life-cycle
- Natural fibers
- Organic
- Plastisol
- Plot printing
- Screen-printing
- Sustainability
- Water based ink
- What is green

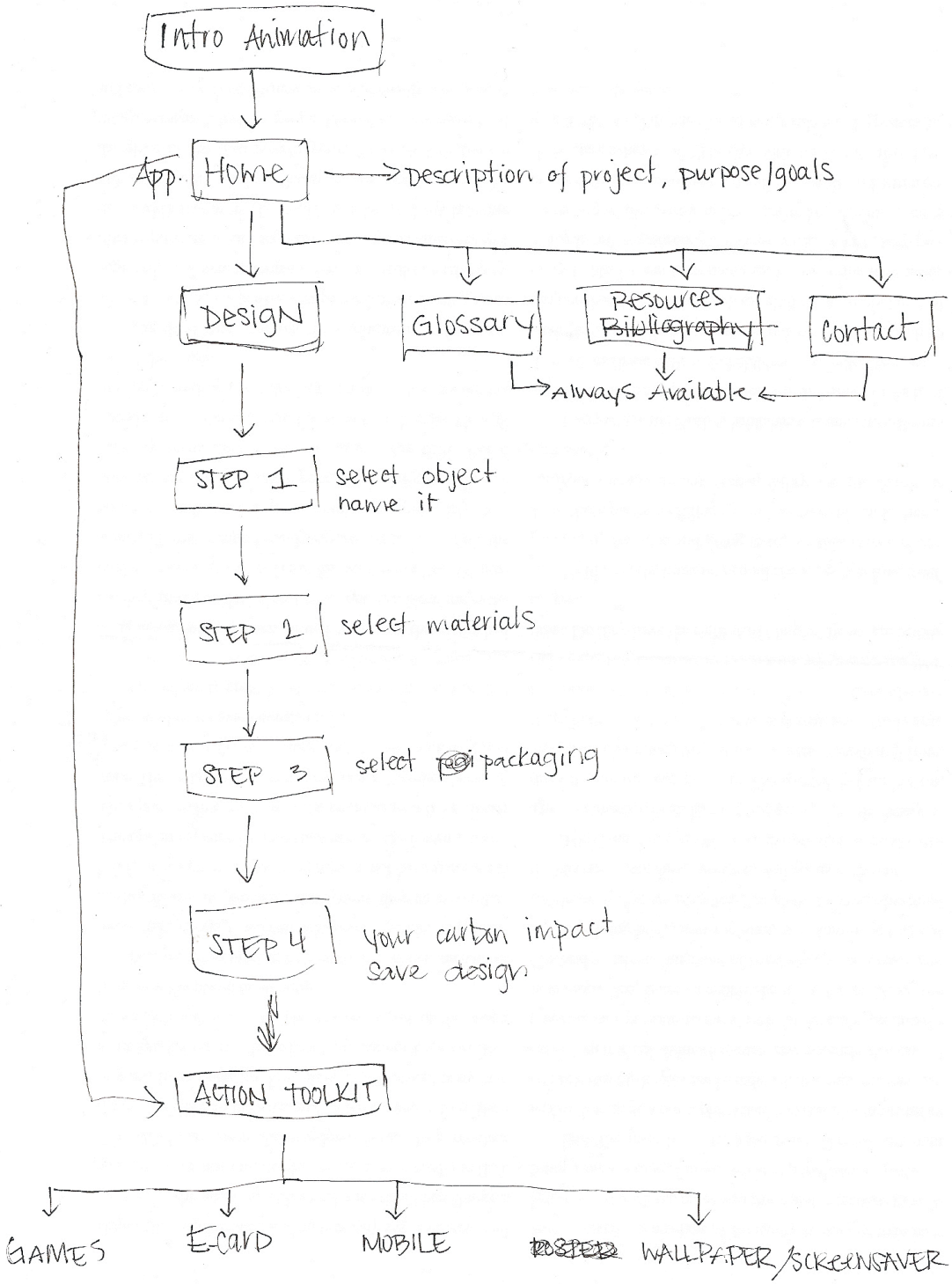
*Contact*

- Email form for feedback

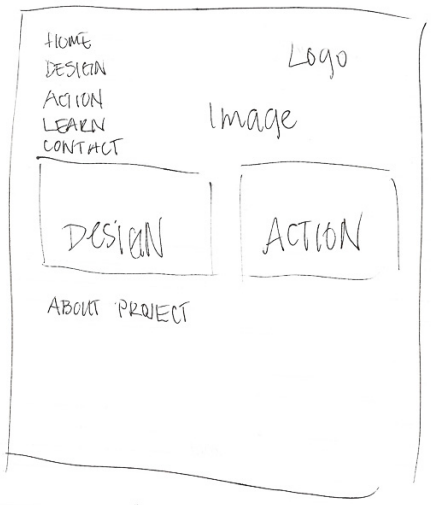
*Learn More*

- Blogs
- Books
- Diagrams (Life cycle t-shirt example)
- Green Maven Search Wiki
- T-shirt companies (eco-friendly)
- Websites

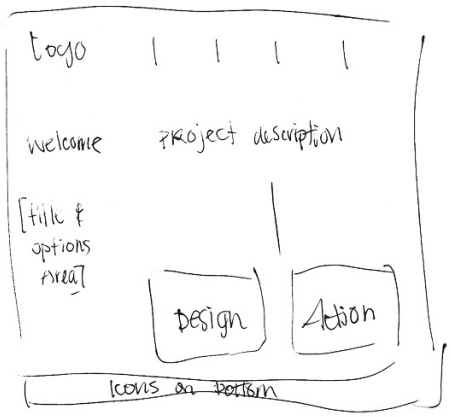
**Appendix** **Original Flowchart:**



**Appendix** **Preliminary Interface Sketches:**




tree texture in back



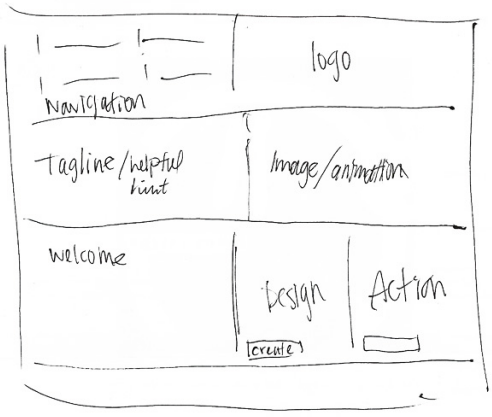

Essentials: 2 ways of navigation
horizontal orientation
clean/minimal design

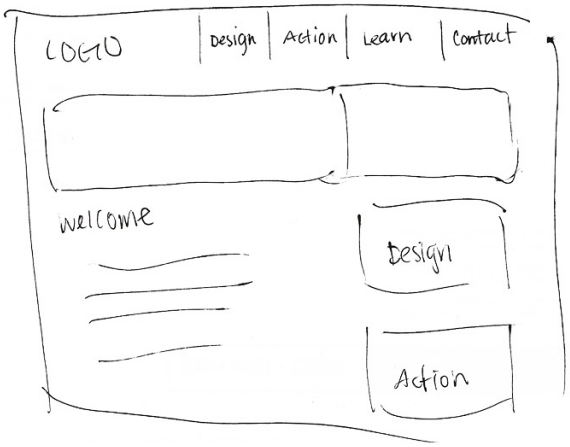
life cycle splash page

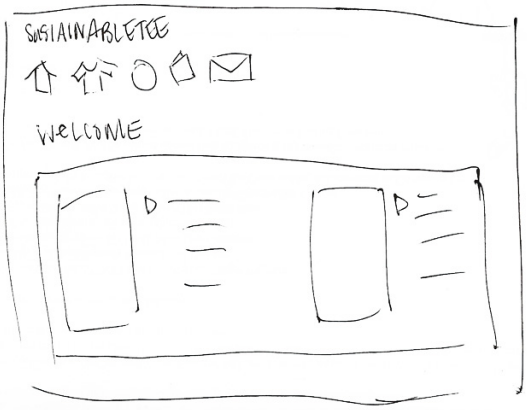
teeshirt material in back

Life cycle in background
cotton – seamless blending background

dirt → cotton
thread → shirt
– back to dirt



# green guide

**Your guide to motivate change and how to start your own campaign to raise awareness for the use of organic materials and fair trade practices.**

## Contents



A resource from Sustainabilitee.info

# introduction

The Sustainabilitee.info green guide is meant to communicate specific methods or ways of addressing the need for sustainable practices in the textile industry. The main goal of this guide is to motivate and change personal attitudes and practices to keep within the planet's carrying capacity.

## What is Sustainability?

"Development that meets the needs of the present without compromising the ability of future generation to meet their own needs."

- World Commission on the Environment and Development

In the textile industry, this means using natural, renewable fibers, preventing chemical use, and cutting down on energy consumption in extraction, production and transport.

## Why Make a Change?

The simple act of growing and harvesting the one pound of cotton fiber needed to make a T-shirt takes an enormous toll on the air, water, and soil, not to mention the health of people living and working in cotton country. This is because of the huge quantities of pesticides used to grow most cotton in the U.S. and abroad.  Pesticides are toxic substances deliberately produced and added to our environment to kill living things, including plants (herbicides), insects (insecticides), fungus (fungicides), rodents (rodenticides) and others.

# sustainable design checklist

## Making Sustainable Choices

**Here are a few questions to ask yourself and clothing companies along with a checklist:**

Why is this the best method?
How can you lessen impact?
What are the impacts of doing this?
Are you designing for re-use/longevity?
Are your designs cyclical not linear?
Did you choose recycled/non-toxic materials?
How can you minimize waste?
How can you minimize ink coverage?
Are you choosing local vendors?
Are you choosing local materials?
Are you using renewable energy?
Do you encourage others to design sustainably?

## Growing

- ☐ Use untreated seeds
- ☐ No GMO plants
- ☐ Use crop rotation methods
- ☐ Physical removal of weeds
- ☐ Control weeds through cultivation and physical means
- ☐ Use beneficial insects, biological and cultural practices to control pests
- ☐ Use trap crops to divert harmful insects
- ☐ Rely mostly on seasonal freezes for defoliation
- ☐ Organic certification
- ☐ Water conservation in treatment and reuse

## Processing

- ☐ Leave yarn in natural state
- ☐ If dyeing, use natural dyes with no bleach or formaldehyde

## Manufacturing

- ☐ Use low impact water-base inks with no plastisol and no solvents
- ☐ Recycle water supply
- ☐ Use 'fully-fashioned' manufacturing process
- ☐ Reuse fabric waste or recycle for non-garment use

## Distribution

- ☐ Packaging reusable
- ☐ Material recycled post consumer waste

# starting a campaign

Information provided by the Sustainable Cotton Project, sustainablecotton.org

**Steps to a successful campaign for change:**

01 Investigate where the clothing in your bookstore comes from. Who supplies your campus? Who makes the apparel purchasing decisions? Often times there is a Clothing Manager who is under contract with a larger company, whereas independent bookstores are run by their own managers and have more leeway in making purchasing decisions.

02 Investigate how student groups purchase their event t-shirts. Survey who supplies your campus with student event t-shirts. Often times a student group will be organized and funded by the Associated Students, whereas independent student groups not bound by campus policies may have more leeway in purchasing decisions.

03 Start mobilizing a coalition. Your local activist group can incorporate this campaign into its program goals, or you may need to start you own coalition. Environmental and anti-sweatshop groups will play a significant role.

04 Educate your community to gather consumer support and awareness.
Table in your student union and give out education materials, get people to sign petitions and send letters.
Ask other groups if you can table at their events.
Ask student groups if you can come and talk to them about purchasing organic fair made cotton t-shirts for their next event.
Get an article about the Campus Campaign published in your local paper.
Get professors to let you talk about organic fair made clothing in relevant classes.

05 Define your campaign goals for the collegiate apparel market.
If your campus-clothing supplier already offers a line of organic fair made collegiate clothes, all you have to do is get them to offer it to your campus.
If your supplier does not carry such a line, you want to pressure them to start offering a line of organic fair made collegiate clothes. It they won't, then you would want your school to switch companies to one that does. The first option will be much more attractive to your administration; the second will require much more work. Your group will also have to decide if you want to get the school to offer ONE line of organic fair made collegiate clothes as an option for students, or do you want a comprehensive purchasing restriction, such that ALL collegiate apparel in your bookstore has to be fair made and organic? This will depend on the political climate of your school and the strength of your mobilization. Many schools won't mind adding an additional product but shy away from replacing existing contracts. But once you get your administration to bring in one offering, it's a lot harder to build up momentum later to pass a purchasing restriction. Set your demands above what realistically can be expected so that you have room to negotiate.

**06** Define you campaign goals for student event t-shirts.
If your local screen printer already offers organic fair made cotton t-shirts, all you have to do is get them to offer it to your campus clubs.
If your screen printer does not carry such a line, you want to pressure them to start offering a line of organic fair made cotton t-shirts. It they won't, then you would want your school to switch to a screen printers that does.
Your group will also have to decide: do you want to get the school to support organic fair made cotton event t-shirts as an option for students, or do you want a comprehensive purchasing restriction, such that ALL student event t-shirts purchased with student fees have to be fair made and organic?
This will depend on the political climate of your school and the strength of your mobilization. Many schools won't mind supporting the cause, but may shy away from placing a purchasing restriction upon the use of student fees. Set your demands above what realistically can be expected so that you have room to negotiate.

**07** Meet with your management and elected officers. Bring in a written letter that addresses your concerns and what you're asking from them, background materials about the campaign, a researched list of companies that offer organic fair made cotton clothes, news clippings about organic cotton, hundreds of signed petitions, and stories about the impact of sweatshop labor and conventional cotton farming. All of these materials are included in this guide. Sound passionate and excited but reasonable and educated. Take their considerations seriously; they will want to know about costs; availability and design limitations; how the monitoring works; they will want to be sure it doesn't add a bunch of new paperwork for them. Try to get them to see how important it is for environmental and social justice reasons, and they'll be more likely to take you seriously. Then if they won't budge, bring in more creative and stronger tactics. Let them know that you will help them promote the new products when they make the switch.

**08** Organize creative actions with your coalition and use the media(see creative events on the next page). Let your campus community know that you are serious about bringing organic fair made cotton clothes to your campus.
Set up a website and use mass media to create a public face to your campaign, and let your administration and student government officers know you are holding them accountable. Use your allies- who in Student Government or procurement offices might support you? Can you do a ballot initiative or a binding legislative bill rather that a nonbonding resolution? Use peer pressure- they can't say it's impossible if other schools are already doing it.

# creative events

Are you looking for some ideas of how to help promote and motivate change in a more creative way than petitions and letters?

**Here are ten suggestions to inspire change:**

01 Invite a speaker to come and educate your campus community.

02 Hold a movie night and show a video on environmental issues.

03 Have a runway eco-fashion show with only organic clothing.

04 Host your own "Project Runway", hold a contest to see who can design the best outfit from organic or sustainable materials.

05 Use organic cotton bags or t-shirts for a fundraising event. Donate the money to a worthy organic or fair trade cause.

06 Travel with a group to cotton producing regions to visit organic and conventional cotton farmers. Learn about cotton production firsthand.

07 Join with your media department and hold a psa video contest.

08 Work with an on campus gallery and organize a show of photographs from a factory with sweatshop condition in the textile industry. Put a face to the cause.

09 Start your own eco-friendly company or share sustainable practices with your coworkers and your boss.

10 Buy (or get donated) organic cotton T-shirts for your group, and print them with a campaign slogan (e.g., "Change your clothes: Support organic cotton clothing at ___").

# working with the media

Remember that media coverage is an integral part of any effective campaign.

**Getting media coverage allows you to:**

- Reach out to a broader audience.
- Educate the public about your issues.
- Put pressure on your targets (whether it is a corporation, elected official, university administrator, etc.) and win your campaigns.
- Builds name recognition for your organization.
- While media coverage is important in achieving these goals, it doesn't "just happen." Getting good media coverage takes some work, and good planning.

## Types of Media Coverage

There are two basic approaches to media work. You can get a reporter to cover a story by faxing a news release or calling to pitch a story, or do it yourself with letters to the editor or opinion articles. The second way is to utilize different types of coverage depending on what the goals of your campaign are and what types of events you are planning. In the course of a campaign, it is likely that you will use more than one strategy.

## Creating a Message

Think through one clear message and stick to it in your media and visibility work. There are three key aspects of a winning message. Without any one of them, your story will lose its coherence or compelling nature.

**PROBLEM**
Frame the issue. Identify why it's important and the broad impact of the situation.

**SOLUTION**
What is organic cotton? How does it solve the problem? How does sustainable agriculture impact farmers?

**TAKE ACTION**
What do readers need to do to change the situation from problem to solution?

# working with the media

**Here are a few basic media tips:**

01 Develop and maintain a list or database of local print, radio and television media – both mainstream and alternative, national and local.

02 Keep the reporter's name, title, company, address, phone, fax number & email.

03 If you are going to take the time to send out a press release or any other kind of article, take the time to make follow-up calls!

04 Return reporters' phone calls as soon as possible; respect their deadlines and professionalism.

05 Prepare a packet of materials that can easily be sent to reporters who are interested in your issue or sent along with articles you submit.

**A media kit should have this basic information:**

- Press release
- Previously published articles on the subject
- Background information on the campaign
- Fact sheets
- Charts, diagrams, infographics
- Additional resources and contact information
- photographs, if available

# sample letter

Date

Dear Name of Owner or Manager,

I am an active eco-conscious member of the community and a customer of yours, and I am concerned about the social and environmental impacts of my consumer choices. As I enjoy buying my apparel here, I want to encourage you to carry certified organic natural fiber clothes. It is my intention to purchase it over other brands.

Many cotton farmers receive market payments for their cotton, which are less than the costs of production. Intensive cotton farming also leads to environmental problems, such as loss of topsoil and monoculture. Industrial cotton farming also contributes to the contamination of air, water and soil through intensive use of synthetic pesticides and fertilizers.

Organic cotton works to correct these imbalances by guaranteeing a premium price for the fiber, as well as eliminating the pounds of chemicals used in production. With the profits generated from receiving a premium price, organic cotton farmers are able to expand their use of sustainable practices on their farm.

For these reasons, I and many other like-minded consumers are now choosing clothes made with organic cotton fibers over other brands. Independent surveys show that 8 out of 10 consumers would rather purchase a product associated with a cause they believe in. There is currently a consumer demand campaign in the local community asking apparel retailers such as yourself to make sure that we can buy organic cotton and natural fiber clothes in your store.

We have researched companies that offer lines of clothing made from organic fibers, and would like to discuss options at your store for purchasing these products.

Offering clothes made from organic fibers would benefit your business, cotton farmers, and the environment around the world. I look forward to discussing this matter in more detail with you.

Sincerely,
Name
Organization/Title
Phone
Email

# sample press release

Information provided by Free the Planet, freetheplanet.org

FOR IMMEDIATE RELEASE Date

**STUDENTS DEMAND A CHANGE OF CLOTHES**
Organic cotton clothing benefits the environment, public health

Students at Anystate University today launched a campaign to have their campus purchase 100% of its T-shirts from companies using organically-grown cotton. This shift would be an easy, effective way for the university to reduce the use of toxic pesticides, student leaders said.

"The cotton in Anystate clothing, like most cotton, is grown with huge amounts of dangerous pesticides," said Joe Activist, president of the college's Free The Planet! chapter. "These are chemicals that pollute the air and water, and can cause serious health effects in people and wildlife. Our government is doing little to protect us from these hazards, so we as consumers are demanding that our university switch to safer, environmentally sound alternatives. In other words, we want a change of clothes."

Organizers of the campaign held an Organic Fashion Show today to showcase the availability of these alternatives. Students modeled clothing from California State University-Chico, which recently became the first university in the country to offer an organic line of cotton, as well as shirts from companies Patagonia and Nike, which have successfully incorporated organic cotton into their business models.

"Most students don't realize they're contributing to environmental destruction when they buy school clothing," said Dr. Scientist. "If the school makes a switch to organic cotton, students won't have to worry about the hidden impacts of their purchase."

According to Free The Planet, more and more students and other consumers are buying organic foods, which shows a growing level of concern surrounding pesticides. However, cotton as a crop uses more of these chemicals than any other crop in the United States.

Over the next few months, the students will continue to educate the campus community about the issue and build student support for organically grown cotton. The most immediate goal of the Change Your Clothes campaign is to persuade Anystate University officials to offer organic cotton wear as one option at the Bookstore. Beyond that, students aim to have the university sign its next major purchasing contract with an organic cotton company and offer 100% organic cotton T-shirts.

# # #

MEDIA CONTACT: Name, Number, Email Address

# writing a petition

Information provided by Care2, thepetitionsite.com

Take action and write and submit a petition that addresses your concern, so that you may effect some change with respect to this important issue. Visit http://www.thepetitionsite.com to start your own petition now.

**You'll need a few things to get started**:

01 Sponsor information (Your name or the name of the organization.)

02 Target information (The name of the person to whom the petition and signatures will be delivered.)

03 Petition headline and description (Name your petition and tell your signers about the issue.)

04 Petition letter (This is the letter you'll deliver to your target.)

05 Signature goal (How many people do you want to sign it? Aim high. Change the world.)

06 Deadline ( How long do you want your petition to be active?)

## Example Headline and Letter

WE DEMAND ORGANIC, FAIR-MADE CLOTHING

We, the undersigned, have educated ourselves about the impact of clothing company purchasing on farmers and the environment around the world. We believe that organic cotton and other natural fiber clothing has a truly beneficial effect on farming communities and on our shared environment. Organic clothes guarantee safe working conditions and help to eliminate toxic chemicals going into our environment. We urge you to recognize our desire to purchase organic clothes, and immediately offer such a clothing line for sale in your store/boutique/shop. Thank you for your time and attention to this matter.

Sincerely,

The Petition Signers

# organic t-shirt company list

### Alternative Apparel
1650 Indian Brook Way, Bldg. 200
Norcross, GA 30093
678.380.1890
678.380.1894 fax
molly@alternativeapparel.com
http://www.alternativeapparel.com/about-alternative/Social-Consciousness.aspx

### American Apparel
747 Warehouse St.
Los Angeles, CA 90021
1.213.688.1474
sustainable@americanapparel.net
http://www.americanapparelorganics.com

### Anvil Knitwear
228 East 45th Street, 4th Floor
New York, NY 10017
212.476.0300
212.808.4790 fax
info@anvilknitwear.com
www.anvilknitwear.com

### Bella
6670 Flotilla Street
Los Angeles, CA 90040
323.727.2005
323.727.2040 fax
support@bella.com
http://www.bella.com/

### Econcious
1805 South McDowell Blvd.
Petaluma, CA 94954
877.326.6660
707.766.8542 fax
info@econscious.net
http://www.econscious.net

### TS Designs
2053 Willow Springs Lane
Burlington, NC 27215
336.229.6426
336.226.4418 fax
eric@tsdesigns.com
http://www.tsdesigns.com

# sources for this guide

**Sustainable Cotton Project**
http://www.sustainablecotton.org

**Free the Planet**
http://www.freetheplanet.org

**Re-nourish**
http://www.re-nourish.com

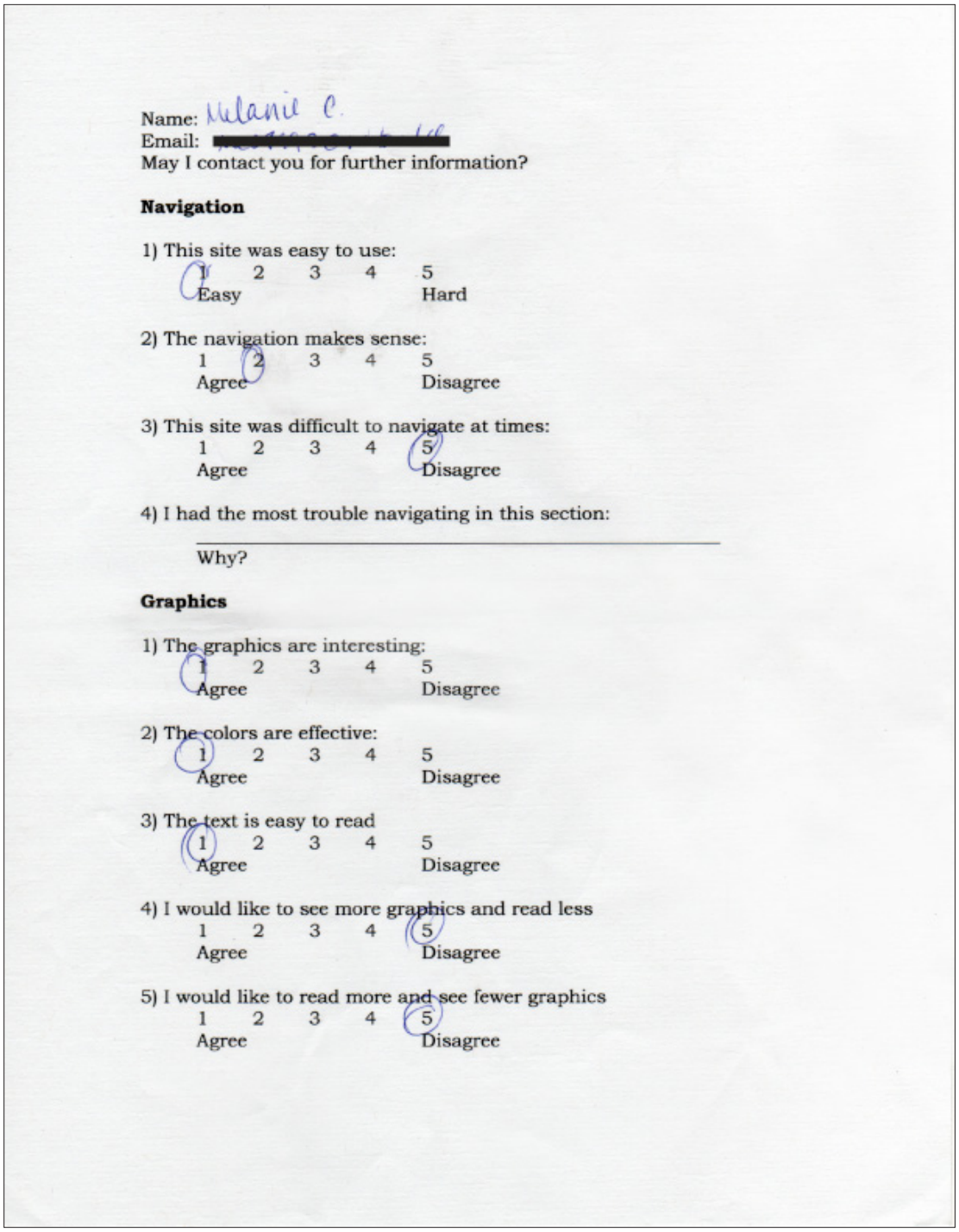
**Organic Consumers Association**
http://www.organicconsumers.org

**Luxury Redefined**
http://www.betterthinking.co.uk/

**Care2 Petitions**
http://www.thepetitionsite.com/

# SURVEY EXAMPLE

## Survey Side A:



Name: Melanie C.
Email: [redacted]
May I contact you for further information?

**Navigation**

1) This site was easy to use:
1 2 3 4 5
Easy Hard

2) The navigation makes sense:
1 2 3 4 5
Agree Disagree

3) This site was difficult to navigate at times:
1 2 3 4 5
Agree Disagree

4) I had the most trouble navigating in this section:
_____
Why?

**Graphics**

1) The graphics are interesting:
1 2 3 4 5
Agree Disagree

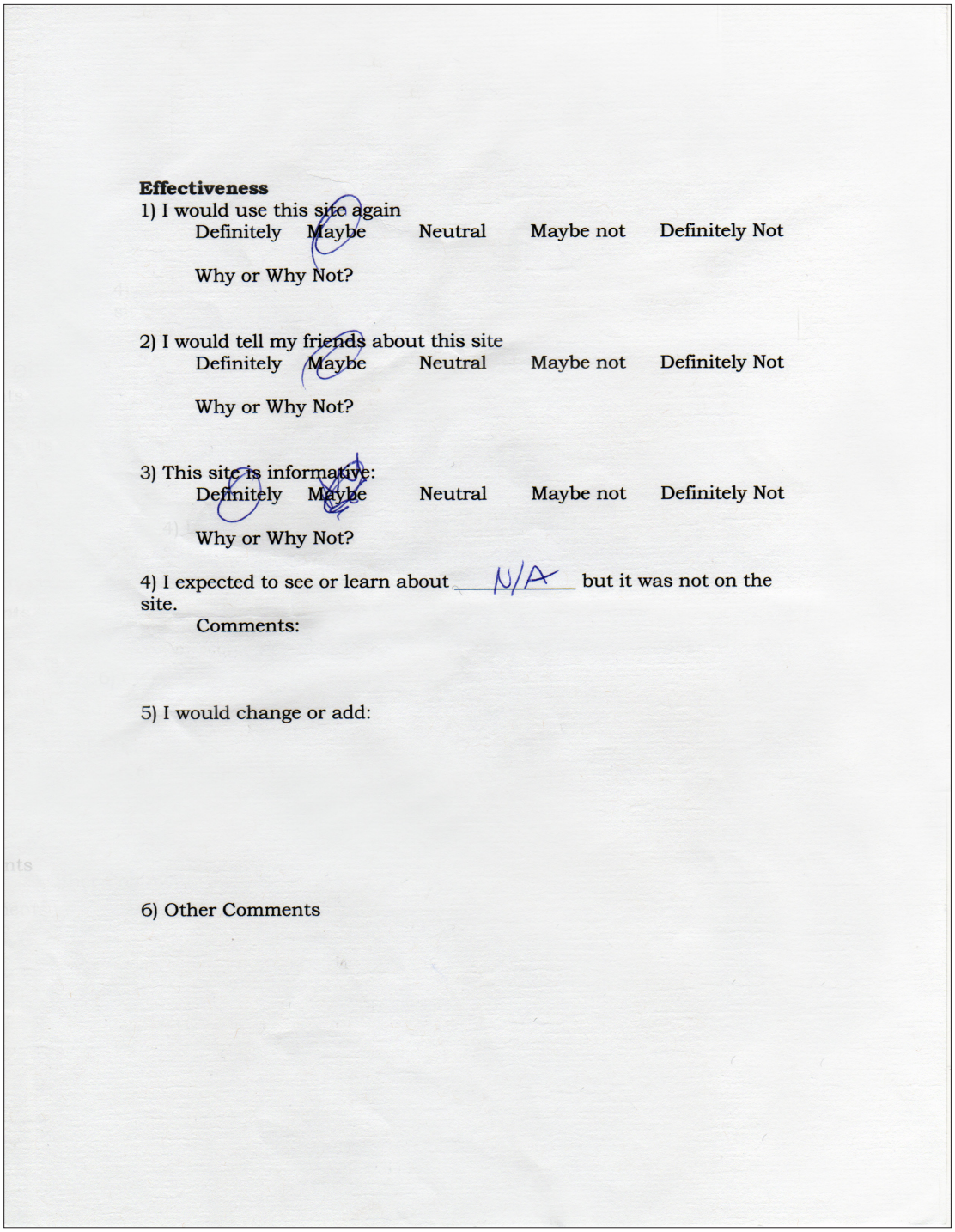
2) The colors are effective:
1 2 3 4 5
Agree Disagree

3) The text is easy to read
1 2 3 4 5
Agree Disagree

4) I would like to see more graphics and read less
1 2 3 4 5
Agree Disagree

5) I would like to read more and see fewer graphics
1 2 3 4 5
Agree Disagree

**Appendix** **Survey Side B:**



**Effectiveness**

1) I would use this site again

Definitely Maybe Neutral Maybe not Definitely Not

Why or Why Not?

2) I would tell my friends about this site

Definitely Maybe Neutral Maybe not Definitely Not

Why or Why Not?

3) This site is informative:

Definitely Maybe Neutral Maybe not Definitely Not

Why or Why Not?

4) I expected to see or learn about N/A but it was not on the site.

Comments:

5) I would change or add:

6) Other Comments

## Thesis Proposal for the Master of Fine Arts Degree

Rochester Institute of Technology
College of Imaging Arts and Sciences
School of Design
Computer Graphics Design

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**Title:** Motivating Change: An Interactive Journey in Sustainability in Environmental Concerns

**Submitted by:** Brittany Lamb

**Date:** October 3, 2008

**Thesis Committee Approval:**

**Chief Adviser:** Associate Professor Chris Jackson, Computer Graphics Design

_____ _____

Signature of Chief Adviser Date

**Associate Adviser:** Interim Academic Director Paul Stiebitz, The Sustainability Institute

_____ _____

Signature of Associate Adviser Date

**Associate Adviser:** Associate Professor Nancy Ciolek, School of Design

_____ _____

Signature of Associate Adviser Date

**School of Design Chairperson Approval:**

**Chairperson, School of Design:** Patti Lachance

_____ _____

Signature of Chairperson Date

# Thesis Proposal for the Master of Fine Arts Degree

Motivating Change: An Interactive Journey in Sustainability in Environmental Concerns
by Brittany Lamb

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**Problem Statement**

The development of this project is motivated by the scarcity of computer graphics in environmental education. I am addressing the question the role of Computer Graphics in promoting and motivating change in people's behaviors related to the environment. What is a sustainable way of presenting this information? I want to focus on an individual efforts affecting global change. I am interested in green product assessment (production/design related), informed product purchasing (consumption), and the development of individual awareness of sustainability. To develop this awareness, the project will evaluate products for energy efficiency, durability, end-of-life, packaging, and use of innovative materials based on the actions of the user.

I will create a Flex/Flash application that requires action or interactivity of the user. This coincides with the idea of promoting people to take action by creating an experience that sparks reactions. It is an application that provides general information, product design, and media design that directly communicates and implements sustainability to develop a lasting change in people's daily behaviors. The project contains elements of a grassroots or social advertising effort designed to grow and be passed on.

Many people are simply unaware of the crisis going on around them. If someone is unaware of a problem, how are they supposed to fix it or do anything about it? Drastic changes need to be made in people's actions and behaviors to sustain our way of life for future generations. I will take an alternative approach in educating people on sustainability of our resources through sustainable design practices in a virtual environment. This alternative approach challenges the general approach of presenting information in print or on a website.

Main components of the application:
*Design Center*
Design an object in a more sustainable manner. The user will be given a choice of product template, design elements (size, color, options in shape), materials, and packaging.

*Green Action Tool Kit*
This is a supporting section that the user will navigate after completion of the design center. This section is also design based but will allow for the user to share his or her creations with other people, spreading the knowledge and taking action on a local level. The user will be able to create an e-card, download from a poster gallery, play games, search for answers to their sustainability questions, and access mobile downloads.

**Background**

Sustainability is a difficult word to narrowly define, because the basic definition evolves and adapts in reference to specific industries. It can generally be defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable design is a branch of sustainability also referred to as green design, eco-design, or environment design. Sustainable design is the product of reacting to the current environmental crisis and is a growing trend within the fields of interior design, industrial design, fashion design,

graphic design, architectural design, engineering, and urban planning. Computer Graphics Design has a limited history in relation to sustainability. A life cycle assessment and life cycle energy analysis to judge the environmental impact or "greenness" of various design choices in Computer Graphics Design would indicate that the field is a relatively green discipline in relation to energy consumption, waste production, and use of natural resources and durability. Computer Graphics Design can be considered a sustainable technology in relation to its use as an educational tool and complements the trend of online classes and technology-infused classrooms.

**Scope**

The project has a major goal of education through interaction. As a highly interactive application, this thesis project requires a direct connection to several areas of computer graphics design. In an effort to promote a green lifestyle and green design, it is important that the production of this product be sustainable. To reduce unnecessary production of energy and waste, the development of this project will be done digitally in a combination of design programs including: Photoshop, Illustrator, InDesign, Flash, Flex, and After Effects. The project will implement strong use of motion through animation, user-controlled interactive design, and motion graphics. Effective design solutions will be reached for layout of the graphical user interface, the information design, and navigation. The viewer/user will interact with the project on a computer through the internet, by running a desktop application, or accessing it from a CD.

**Literature Survey**

*www.printgreener.com*
2006
Greenprint, LLC.
This site enforces the negative impact of excessive paper use. It is an example of clean and simple graphical user interface design. The facts presented on this site will be useful in the action toolkit of my thesis project, educating on sustainable printing practices.

*www.inhabitat.com*
2007
A weblog started by NYC designer Jill Fehrenbacher. It investigates the future of design, innovations in technology, and sustainable practices. There is a stronger devotion to interior and architectural design, as well as product design. It is a display of cutting-edge design solutions for sustainability in fields that can closely relate to Computer Graphics Design.

*www.treehugger.com*
2007
This website has the tagline of Learn, Share, Discuss and is considered a media outlet dedicated to driving the popularity of sustainability. Content is made up of newsletters, video segments, a radio show, blogs, articles, and resources. The site focuses on informing the user, interacting with the user, and motivating the user to take action. The site's main goals are an example of what I plan to achieve with my project. I am taking on a different approach by expanding on the idea of interactivity.

*1000 Words: A Manifesto on Sustainability In Design*
Allan Chochinov
2007
This manifesto is divided into ten categories. Each category discusses individual guidelines or gives advice on sustainable design issues or ideas. It is direct, informational, and intends to motivate readers. This manifesto is a beneficial mission statement to adhere to in the development and implementation of my project. www.core77.com

*www.futurescapes.com.au*
The Gould League
2002-2007
Futurescapes is an application that allows the user to answer questions about their day-to-day actions and living standards and then calculates the outlook for their future. It demonstrates how our choices and actions determine the sustainability of our environment and is a great example of an interactive project promoting sustainability. I will build on use of graphical imagery, providing more specific information and the element of customization.

**Methodology**

*Design*
An interactive application that includes a graphical user interface, information design, quality bitmap images, vector illustrations, poster design, animation, and motion graphics. The overall aesthetic is a clean, elegant design complemented with a cool blue/green color palette. A custom logo will function to brand the application and further communicate the subject to the user.

*Subjects or participants*
There are three stages of usability testing throughout the development of the project, mainly directed at the average age and educational level of the target audience. The first testing takes place after a working graphical user interface has been developed. This stage of testing is on a smaller scale and will include the thesis project committee and select fellow graduate students in the fields of graphic design, computer graphics design, and industrial design. The second stage of usability testing will be an organized study drawing from undergraduate New Media and IT students. The second stage testing coincides with a working prototype. Final stage usability testing commences with the finished application. The main purpose for final stage testing is to work out minor design issues, navigational difficulties, and programming bugs.

*Instruments*
The user will evaluate the overall effectiveness of the graphical user interface design, navigation, presentation of content, use of interactivity, and retention of material and will communicate his or her responses and suggestions via an online survey. Results will be measured on a scale ranging from strongly agree to strongly disagree and be evaluated by percentages. In addition the project will include continuous user testing through a user response form for feedback to allow the project to continually grow and evolve.

*Procedure*
Research begins with the documentation of online resources including social communities, blogs, media, informational sites, and educational tools related to environmental issues and sustainable design. The new Sustainability Institute at RIT provides additional resources with faculty members and newly developed degree programs. It will be valuable to evaluate the educational tools that will be used to support these programs. Interactive applications used in other fields will be beneficial as benchmarks for graphical user interface design, methods, information design, elements of interactivity and overall implementation. The evaluation of this research will produce a complete outline of project needs. I can then determine what graphics, layouts, interactivity, and information will best suit the interest of the project. Once the assets of the project are developed, the technical needs or programming requirements will be evident. Programming of the project will be allotted more than sufficient time to battle any unforeseen technical problems. A prototype and then a fully functional project will be the end result of experimentation and usability testing.

**Limitations**

I have no previous experience in developing Flex rich media applications, which may contribute to unforeseen complications in relation to programming and assimilation of individual design components made outside the program. Sustainable design and education of sustainable design is a relatively new field with limited resources, research, and innovations in relation to Computer Graphics Design. The success of this project heavily relies on the users ability to operate a computer and mouse and navigate a website or interactive application.

**Implications of the Research**

The results of the user's interaction and experimentation with the interactive graphical user interface and information-based content will indicate a stronger comprehension of significant environmental concerns. On the lowest level, the user will have an introduction to and awareness of environmental problems and common misconceptions will be resolved. The intended outcome of my research and thesis project is Education, Innovation, and Communication. There is a scarcity of interactive education in sustainability for age ranges and education levels. I am developing an alternative approach to learning to supplement conventional methods of learning. With innovations in technology and the popularity of smart classrooms, there is a need for new learning material.

**Peer Review**

Communication Arts Interactive Design Competition
HOW magazine's Interactive Design Competition
BD4D interactive design competition
Inhabitat Design Competitions
iDA International Design Awards

**Target Audience**

Male / Female
Age: 16+
Educational Level: High School and beyond
Motivational Level: Medium to high
General awareness of thesis subject matter
Knowledge of computer basics

*Persona One*

Michelle is an 18-year-old and a freshman New Media Design student in Ohio. She is comfortable using a computer and accesses the web an average of five hours a day. She is motivated in her career plans to become a web designer and developer. Michelle is opinionated in her views and is quick to offer feedback in both her professional and personal life. She has a broad knowledge of artistic disciplines and design issues. She is a highly visual person and pursues hobbies related to her interest in photography. She has a general idea of current social and political issues and how they may affect her.

*Persona Two*

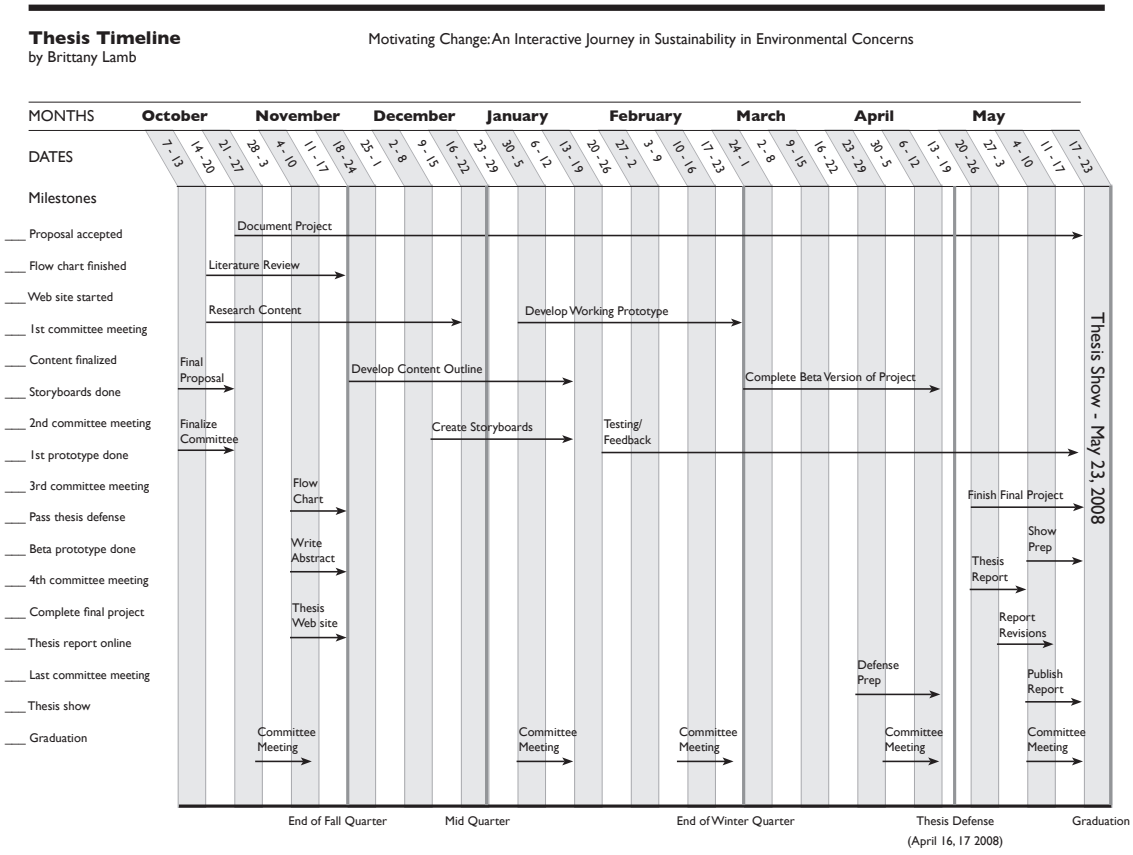
Peter is a 29-year-old Civil Engineer living in New York. He is married with two children. He is very comfortable using a computer and works on one an average of seven hours a day including work and personal use. He is an advanced internet user and writes his own blog on current world environmental issues. He is focused and hardworking. Peter is fact oriented and seeks accurate and credible information when pursuing his goals. He values usability and function over aesthetics. He seeks recent innovations and developments in areas of interest such as environmental and materials engineering.

**Software and Hardware Requirements**

- Macintosh G5
- IBM Compatible PC with at least a Pentium IV processor and Windows VISTA or Windows XP Professional
- 500 MB free disk space and 128 MB main memory
- Flash Player 8
- Internet Browser

**Timeline**

See attached timeline



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